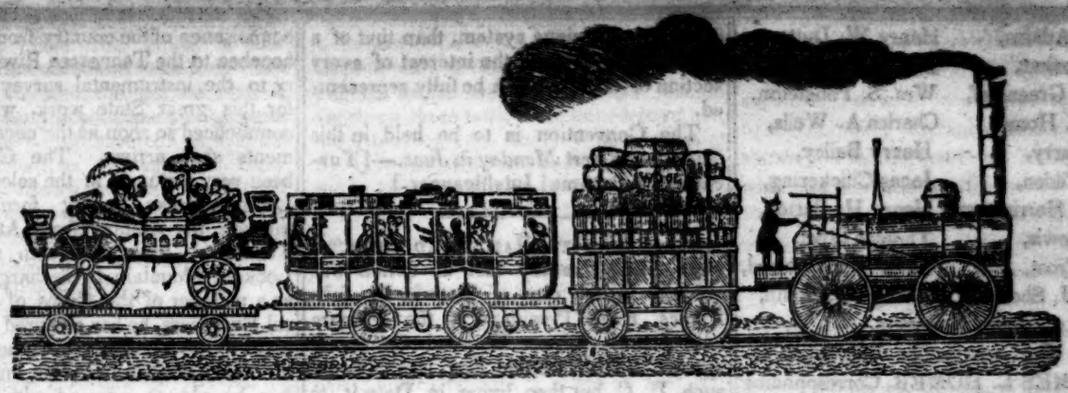

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 30 WALL STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

D. K MINOR, and GEORGE C. SCHAEFFER, } EDITORS AND PROPRIETORS.] SATURDAY, JUNE 3, 1837. VOLUME VI—No. 22.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, JUNE 3, 1837.

REMOVAL.—The Office of the RAILROAD JOURNAL, NEW-YORK FARMER, and MECHANIC'S MAGAZINE, is removed to No. 30 WALL-STREET, *basement story*, one door from William-street, and *opposite the Bank of America*.

☞ SUBSCRIBERS IN THIS CITY, who change their residence on the 1st of May, will please give notice at the office, 30 Wall-street, *Basement Story*. It is desirable that the notice should specify their late and future residence.

TO CONTRACTORS.

PROPOSALS will be received until Tuesday evening, the 27th June next, at the office of the Wrightsville, York and Gettysburgh Railroad, in York, for laying a single track of Rails on 12 miles of the above road, extending from Wrightsville to York

☞ Plans and specifications of the work will be exhibited in the office after Monday, the 8th inst., and further information will be furnished by Mr. J. F. HOUSTON, P. M, at York.

F. W. MIFFLIN, C. E.

May 8, 1837. 22—3t

NOTICE TO CARPENTERS.

A number of Carpenters are wanted to lay the superstructure of the Georgia Railroad, to whom liberal wages will be given.

The road traverses an elevated ridge which is entirely free from any local cause of sickness.

JOHN EDGAR THOMSON, Ch. Eng.

Engineers Office, May 22, 1837. 22—3t*

NOTICE TO CONTRACTORS.

NOTICE is hereby given that the grading of the 'Buffalo and Mississippi Railroad,' for a double track, between Michigan city and La Porte, a distance of 12 miles, will be let at public out-cry, to the lowest bidder, at La Porte, on Wednesday, the 14th day of June next.

The Maps, Profiles and Estimates of the route will be ready for examination at the Engineer's office in La Porte, after the first of June.

R. STEWART, President.

Michigan City, April 23, 1837. 22—2t m

MECHANICS' FAIR IN BOSTON, MASS.—We give the following notice of the Board of Managers of the MASSACHUSETTS CHARITABLE MECHANICS' ASSOCIATION, for their First Annual Fair, to be held in September next. We are gratified to see that the Mechanics' of Boston are not to be outdone by other cities, in the establishment of such institutions for the benefit of industrious and enterprising Mechanics. We anticipate a splendid exhibition of New-England ingenuity, industry and skill.

MECHANICS' FAIR.

Notice to Mechanics, Artisans, Manufacturers, &c.—The undersigned give notice that the first Annual FAIR of the Massachusetts Charitable Mechanics' Association will be held in the city of Boston, in September next, commencing on Monday the 18th, and continuing at least three days.

The Association have placed at the disposal of the Board of Managers, the sum of Five Thousand Dollars, to enable them to conduct the Fair upon a liberal scale; and they hope to be able to render satisfaction to all who may feel disposed to offer articles for exhibition.

Medals or Diplomas will be awarded to the owners of all articles that may be deemed worthy of such distinction; and the Managers intend that the strictest impartiality and fairness shall be observed in the distribution of Premiums.

The Managers, in furtherance of the object they have in view, invite contributions of articles from every department of industry; of choice specimens of American ingenuity and skill; rare and valuable domestic productions, natural or artificial; the delicate and beautiful handiwork of females; useful labor-saving machines, implements of husbandry, and new models of machinery, in all their varieties.

Judges will be appointed to examine all articles offered, and the managers will award a gold or silver medal, or a diploma, to all articles that may be pronounced by the judges worthy of reward.

Articles intended for exhibition, must be delivered on or before Wednesday, September 13th.

Arrangements will be made to exhibit, *in operation*, any working models that may be offered, which will render the exhibition useful and interesting, and the managers respectfully invite contributions in this branch. A careful and competent superintendent will be appointed to take chare of all models sent for this purpose.

Board of Managers.

Stephen Fairbanks, Jos. T. Buckingham,
John Rayner, James Clark,

William Adams,	Henry W. Dutton,
Uriel Crocker,	George Darracott,
Gardner Greenleaf,	Wm. S. Pendleton,
James L. Homer,	Charles A. Wells,
James Barry,	Henry Bailey,
Joseph Tilden,	Jonas Chickering,
Ephraim Harrington,	Henry H. Barton,
Joseph Lewis,	Thomas Boyd,
Walter Frost,	Wm. Uunderwood,
Thomas J. Shelton,	George G. Smith,
John G. Rogers.	

P. S. For any further information address JAMES L. HOMER, Corresponding Secretary, Boston.

Boston, March 24, 1837. m28–ts1

☞ Should any subscriber receive his account, by any means, *incorrectly made out*, he will confer a *special favor* by returning the account, with a *copy* at full length of his *last receipt*. The *name* signed to the receipt, with *all* the *dates*, are important to correct the books.

This request is made in consequence of the detection of several errors which occurred in consequence of the destruction of our office by the great fire, and the omission of a few names by collectors.

Postponement.—The time for receiving proposals for laying the rails on the Railroad between Wrightsville and York, has been postponed until the 27th of June.—Those papers requested to copy the advertisement will make the correction and give it three additional weekly insertions.—[Star and Banner.]

The Rideau Canal has been in full operation since the 4th inst., and the Company's Steamboats are running full trips. On Saturday afternoon, the Rideau arrived with two barges in tow, all laden with goods, and with a large number of passengers, mechanics and laborers from Bytown and the neighborhood.—[Kingston (U. C.) Herald.]

Compliment to American Genius.—Our mechanic Avery's simplified steam engine, exhibited in full and successful operation at the last New-York Fair, and since admirably applied to various mills in the interior is highly extolled by the learned Dr. Lardner, and is to be reported upon at the French Institute, by the illustrious astronomer Arago. What will they say of the total abandonment of fuel and steam in Davenport's Electro-magnectic Rotary machine?—[N. Y. Star.]

Internal Improvement Convention.—We are glad to perceive that the people generally approve of the proposed Convention. Delegates have been appointed in many of the counties. We hope to see all the counties represented. It is an important subject, and no plan can be more effectual in concentrating public sentiment in favor of a judicious system, than that of a Convention, in which the interest of every section of the State can be fully represented.

The Convention is to be held in this place on the *first Monday in June*.—[Tuscaloosa (Alabama) Intelligencer.]

Important to Rail Road Subscribers.—On Tuesday last an action was brought in the city of Detroit by *John Prince*, Esq. (President of the Niagara and Detroit Rivers Railroad Company) against *Robert Bolton*, Esq. late of Sandwich, U. C. but then living in Detroit, to recover the sum of $31,25, being his first instalment of 2½ per cent. on 50 shares taken by him in the above stock.

Mr. Bolton employed Messrs. O'Keefe and Churchman, counsellors at law, to defend the action; and they resisted the demand upon several grounds, and especially on an alleged *want of consideration, and because the scrip had not been delivered or tendered to their client.*

Mr. Prince conducted the case in behalf of the Company, and answered the objections raised by the defendant's counsel.

The jury retired, and in about a quarter of an hour returned with a verdict for the plaintiff for *the full amount*, which carried costs also.

This case establishes a precedent which renders the subscribers to railroad stock liable to be sued at law for the amount of their subscriptions.—[Detroit Courier.]

Railroads at the South.—We find the following article from a Georgia paper called the "Federal Union" in the "Georgean." It evinces a spirit and a proper sense of the advantages of internal improvements, which does credit to the Editor. We are always happy to meet with *such* advocates of the system, which *more than any other*, will continue in existence *the* Federal Union of which we as a people have been so justly proud.

The remarks of the Editor in relation to the opposition of men in "high places" to the public works of Georgia, will apply as well to other States as to Georgia—and we regret that it is so. *Opposition* however fortunately cannot *prevent* the success of such works as the *New-York and Erie*, the *Baltimore and Ohio*, the *James River and Kanawha*, the *Charleston and Cincinnati*, and the Georgia, *Western and Atlantic* Improvements. The People require them and they will be accomplished in due time. Will the Editor of the "Federal Union" exchange with us?

From the Federal Union.

WESTERN AND ATLANTIC RAILROAD.

It gives us much pleasure to state, that Colonel Long, the Chief Civil Engineer of the State, arrived in this city on Saturday evening last, and is now making preparations to proceed immediately to make a reconnoisance of the country from the Chattahoochee to the Tennessee River, preparatory to the instrumental survey of the route for this great State work, which will be commenced so soon as the necessary instruments shall arrive. The Governor has been very fortunate in the selection of Col. Long, because having formerly passed through the country from Athens to the Tennessee River, on both sides of the Lookout Mountain, in discharge of his duty as a member of the Corps of Topographical Engineers, he has acquired much knowledge of the Topography of the route where the road will probably pass, and will therefore be able to proceed with the surveys much faster than one who does not possess this information.

There can be no doubt now, that the work of internal improvement in Georgia, will be prosecuted with energy and despatch, and that before the fall, a considerable portion of the road from the Tennessee to the Chattahoochee, will be located—under contract—and partly performed.

This important road, designed to connect the great west with the Southern Atlantic sea coast through the territory of Georgia, is a work that will be productive of more benefit, and reflect more honor on the State than any thing she has heretofore attempted.

The enlarged and liberal views of the members of the last legislature, manifested in the act for the construction of this road, and in the distribution through the Central Bank, of the surplus revenue to the people, are worthy of all praise. Yet strange to tell, there are men, and some too, who fill high places, who openly denounce both these acts, thus exerting their influence against the best interest ot the State. But the people will not heed such advisers. The spirit of internal improvement is aroused, and Georgia though late to begin, will not linger in the glorious race she has commenced.—Her best and most intelligent citizens are united in this policy,—thay do not doubt the most brilliant results. They look confidently forward to the day in which Georgia will be traversed from the sea to the mountains in railroad cars, travelling at the rate of 20 miles or upwards in an hour. Then will the voice of revilling be hushed and those who now oppose this enterprise be laughed to scorn. The pressure of the times but urges us onwards in this important matter, and unless we greatly err the people will be but the more confirmed in the necessity of bringing all their energies to its aid.

We are proud to say that his Excellency, Governor Schley, has been very active and zealous in the cause of internal improvement not only in his exertions to procure the passage of the law pledging the funds of the State for the construction of this road, during the last session, but in procuring competent persons to execute that law, and we understand that he intends as soon as he can, consistently with the discharge of his official duties at the seat of Government to repair to the line of the road and aid as far as may be in his power to expedite the work.

The Railroad.—By the time our paper is issued the whole line of the railroad from Michigan City to Laporte will have been run.

Through the persevering labors of Gen. Orr, all the relinquishments have been made both in the city and through the interior, and the necessary depots and tracks within the city located. Great credit is also due to that gentleman, as well as to Col. Stewart, and Gen. Brown, for the able, efficient, and zealous manner in which they have performed the arduous duties intrusted to them. Nor ought we to suffer the opportunity to pass without congratulating the public and the stockholders on the unanimity and good feeling which have prevailed among all parties. The relinquishments have been made in that generous spirit of enterprise and noble impulse which has ever characterized our section of the country, and which is always ready to second any efforts made or projected for the general good. Independent of this it may not be invidious to advert to what has been done within the immediate limits of our city. The Michigan city Company, through their trustees, Col. Teall, and Wm. H. Goodhue, Esq., the West Addition Company through their agent, Willys Peck, Esq., and James Forrester, Esq., whose lands corner together at the most eligible spot, have donated to the Railroad Company, for its general and manufacturing depot, a quantity of land amounting to upwards of fifteen acres—the present value of which may be estimated by those even at a distance, when informed that it lies almost in the heart of the city. This general depot will be reached by an arm branching off upon eight streets.

Nor is this all. The Railroad is designed to pass down Wabash street, on which it reaches the Lake, by a double track in the centre of that street. A depot also, for the passenger cars, is to be constructed in the centre of Wabash street, between eighth and ninth, of a spacious and convenient size, for which the requisite ground has also been donated, and so as to leave the street, at this point, one hundred and forty feet wide, none of this valuable property costing the Railroad Company a solitary dollar.

Probably no section of the country could be pointed out presenting fewer obstructions for laying a railroad than this. The undulations are few and slight, and that useful, and in most places, indispensable tool, a pick-axe, will not need handling the whole distance. By an advertisement in another column, it will be seen, that the grading will be let out, at public out-cry, on the 14th of next month, and we know there are enterprising men enough in this country to undertake and carry it through without delay. We hope to have it in our power shortly to lay the Charter before our readers.—[Michigan City Gaz.]

EXTRAORDINARY DRAUGHT BY ONE HORSE.

The following extraordinary feat of a draft horse has been recorded. Soon after the completion of the Surrey Iron Railway, and when it was open for the conveyance of goods from Wandsworth to Mertsham, a bet was made, that a common horse could draw thirty-six tons for six miles along this road, and that he should commence his labor with a dead pull, as well as turn it round the occasional windings of the road. A number of persons assembled near Mertsham to witness the performance. Twelve wagons loaded with stones, each wagon weighing three tons, were linked together, and a horse taken from a timber team of Mr. Harwood was hooked to the first wagon. He started from near the Fox public house, and drew this immense weight with apparent ease, to near the turnpike at Croydon, a distance of six miles, in one hour and forty-one minutes. In the course of his journey, he was stopped four times, in order to show that it was not by the acquired impetus that he performed the task. After each stoppage, a chain of four wagons was added to the train, with which the same horse set off again without difficulty, even after about fifty men had mounted them.—[Far. Mag.]

CANAL BOAT PERFORMANCE.—The Providence Journal states that the Canal Boat William Wirt, for Worcester, laden with 560 bushels salt, and 100 barrels of flour, (27 tons,) went over the dam, ten feet, at the 'Sinking Fund,' on Saturday, at 12 o'- without the slightes damage to boat or cargo, or the lest blame to any one.

From the New-York Farmer.

STATISTICS OF GREAT BRITAIN.

STATISTICS OF THE BRITISH EMPIRE.—A highly valuable work on this subject has been recently given to the public by James McQueen, and dedicated to the Duke of Wellington. We infer from this circumstance that its authority may be relied upon; and we believe that many of its details, especially as far as they relate to agriculture, come within the province of this work; and will be interesting and instructive to our readers. Statistical facts are always valuable; but we do not think in this country sufficiently appreciated. They alone enable us to form any think like an exact opinion of the actual condition of a country, its actual wants, its actual capacities and improvements. They are extremely useful to the age in which they are given; and they remain as most important documents of reference to all succeeding periods. With respect to many matters of national policy and legislation, they are the only safe grounds of action; and the most serious mistakes have been made for a want of this knowledge. In many subjects of statistical detail, perfect accuracy is not attainable. Changes are perpetually occurring, and allowance for these changes, in the shape of what sailors call 'dead reckoning,' must be made. But even a tolerable approximation to the truth is infinitely better than mere vague guesses or conjecture. The extreme difficulty and labor requisite in procuring such details can be but very imperfectly estimated by those who have made no experiments of this kind; the difficulty of superintending the press in such cases, so as to insure accuracy, is not inconsiderable; extreme candor is to be shown and the highest credit is due to those who busy themselves in this severe and humble labor; and present the results to the public eye with all the accuracy which extreme diligence an pains taking can secure. This work, though compressed into a thin octavo, could not have been executed in the manner it has been done, without application to numerous, various, difficult and distant sources of information. We shall make such few extracts from it as may be most likely to command attention.

The rents of land in England, vary from 20*s.* to 3*l.* sterling per acre. In Scotland, from 20*s.* to 7*l.* per acre. The latter very high rents are in the finely cultivated districts of Mid Lothian, and probably in the neighborhood of city markets. The average rent is put at 25*s.* to the acre. Rent in Ireland, on land manured for a crop, is 9*l.*; not manured 2*l.* to 3*l.* The average rent in Ireland is put down at 23*s.* per acre. Land in Ireland sold for thirty years, we should rather say leased, is calculated to yield 3½ per cent. Rent of sheep pasture in Scotland, is from 3*s.* to 6*s.* per acre. The wear and tear of horses is estimated at one-tenth; so that there is a complete absorption of this species of capital once in ten years. This fact, if well established, has a most important bearing upon the question of the comparative expediency of employing horses or oxen for farming purposes; the former a deteriorating, the latter when properly managed, an improving capital. This single circumstance of difference will not however by any means decide the question. Many other matters are to be taken into the account, and at present we forbear a judgment.

HORSES.—The whole number of horses now owned (1832) in Great Britain 1.412,-797. Add for Ireland one half more 706,-398. Total. Great Britain and Ireland 2.119,705. We have in a note some other details. The number of horses in the Prussian provinces was in 1825—Horses 1.202,-642. Colts, 199,706. Total, 1.402,348. The number of horses in France is stated to be 2.400,000. The estimated value of riding and carriage horses in England, is 40*l.* each—of horses for agricultural purposes, 25*l.* each. Total value, £60,630,130 sterling—a considerable capital to be literally *worked up* once in ten years.

BLACK CATTLE.—The number of Black Cattle in the United Kingdom is estimated at 15.000,000. According to the agricul-

tural report of 1833, the value of cows bought, is from 13*l.* to 15*l.*—and of oxen, working, 14*l.* to 16*l.*, and of those sold from 18*l.* to 20*l.* The wear and tear, or loss in cattle annually, is reckoned as in horses, about one-tenth. The absolute loss of one-tenth of black cattle, by disease or accident, so as to be worthless, excepting for their hides, as of horses, in a year, must, if so understood, be a great overstatement. The total number of cattle and calves slaughtered in London in the year 1834–5, was 177,000. The average weight of the cattle was 880 lbs. each. The number slaughtered in Liverpool, Manchester, Leeds, Sheffield and Birmingham, according to the Agricultural Report of 1821, was yearly 47,859 cattle, 668 lbs. each; and 52,448 calves at 90 lbs. each. The number killed in Ireland to procure salt-beef must be great, when it is known that reduced as that salt-beef trade is, still the quantity exported to all foreign parts was in 1825, 73,135 barrels, or 219,305 cwts., equal to at least 30,000 of the heaviest oxen alluded to. The Kyloe breed of cattle in the West Highlands are very numerous; thousands of these cattle are fed, and fattened, and slaughtered yearly in every part of Scotland and England; their price is very high; three years old, 13 to 14 guineas each in 1816. The total number, classes, and value of black cattle, thus: Bulls, young and old, 500,000. Cows, do., 7,000,000. Oxen, &c. fattened to kill, 2,000,000. Oxen growing up for fatting 4,000,000. Oxen, used to work, 500,000. Cattle to supply wastage, 1,400,000. Total, 15,400,000. The total value, which, at 14*l.* per head, we think must be an over-estimate, is set down at £215,600,000.

A note here, in giving the modes of keep in some places, states that in Jutland a cow yields from 64 to 84 lbs. of butter; in Holland, the same; in Zealand, less milk given to calves, 84 lbs. do. A horse has weekly 84 lbs. of straw, 56 lbs. of hay; 88 lbs. of barley or 96 lbs. of oats. A cow of middle size daily 8 lbs. of straw and 8 lbs. of hay during the 220 days she is in the stall. When fed with potatoes, must have 52 lbs. per day, but with this, less straw and hay. From seven to ten sheep consume as much as one cow during 180 days they are housed. The number of black cattle in the United States in 1827, was estimated at 14,000,000. By what means this estimate was formed, I am unable to say.

Poultry and Rabbits.—"The amount of capital vested in these two species of agricultural stock is of no mean importance; and much more considerable than is generally thought. According to the Times newspaper, Nov. 20, 1835, the consumption of poultry in London for the year was about 80,000*l.*, and rabbits 14,000*l.* On the same scale for the kingdom, the value of the former would be nearly 1,000,000*l.*, and the latter in number 168,000, and the value 34000*l.* The skin of the rabbit is very valuable, being double the value of the carcase. At Dunfries' February fair, 30,000 rabbit-skins have been sold. In Feverham, rabbits and pigeons are very numerous. In the district of Brundon, Suffolk, are 350 pigeon houses; here also 40,000 rabbits are produced yearly. The Agricultural Committee of 1833, sets down the produce of pigs and poultry on a farm of 100 acres at 20*l.* annually; this, taking the farms wholly arable at 490,000, gives 9,800,000*l.* yearly, which sum, even on this scale, must be more than doubled, for the poultry, &c., raised by sheep farmers, and all other classes, who keep poultry; also it must be taken into the account that the above produce, at 20*l.*, is exclusive of the value consumed on the farms, &c., which, say one-fourth, would give for pigs and poultry, a consumption annually of about 25,000,000*l.*, leaving for poultry about 2,500,000*l.*; and admitting that stock is in the proportion of four-fifths to the produce, we have a capital of 9,000,000*l.* or 10,000,000*l.* invested in poultry, rabbits, &c., which, great as it is, is probably very near the truth. When we look at the immense number of eggs, brought from Ireland (50 tons of eggs and 10 tons of live and dead poultry being shipped from Dublin alone in one day) and 66,000,000 eggs, imported from France for London alone; and this immense number, a trifle certainly to what are produced in this country, we shall cease to wonder at the large capital here stated to be invested in poultry of all kinds. The quantity of eggs imported into Liverpool from Ireland in 1832 was 4097 crates, value 81,940*l.*, which at 6*d.* per dozen, gives 3,777,600 dozens, and the number 39,331,200. The number imported into Glasgow from Ireland, in 1835, by the Custom-House entries, was 19,321 cwts.; at nine to a pound gives 17,459,568. In 1833, the import has increased to 7,857 crates, or upwards of 70,000,000." Of sheep and swine, we shall give further details on a future occasion.

Produce of one Seed.—Extract from proceedings at a late meeting of the Northamptonshire Farming Society in England:

Mr. Hillyard then produced his bag of turnip seed, for which a great scramble took place amidst much laughter. He observed that one of the advantages of these turnips was, that they would not run to top, if allowed to stand till late in the year. He had seen turnips in April run to top until they resembled a painter's brush. As an evidence that they were well worth attending to, he would mention that some time ago, he was walking over a turnip field in a distant county, when he perceived that the turnips were exactly the same sort as those he was now showing. Upon mentioning the fact to the owner, he confirmed it, adding that his son had obtained *one of the seeds* handed round by him after the dinner of the society; that he had sown it; and liked it so much that he preserved the produce; and had now his farm stocked from that insignificant origin.—[B. Farmer's Magazine, Oct., 1836.

Death of Rev. Henry Berry.—By a late number of the British Farmer's Magazine, we have the painful annunciation of the death of the Rev. Henry Berry, for some time the editor of that useful publication.—He died on the 24th August last. He was eminently distinguished as a scientific and practical farmer; for the zealous aid which he was always ready to lend to the farming interests; and particularly for his able defence of, and his long and distinguished success in improving the breed of improved Durham Short Horns. The death of such a friend of agriculture is a serious public loss.

H. C.

From the Journal of the Franklin Institute.

NEW PATENT LAW.

We have now the pleasure of prese ting to the public the Law for the restoration of the Records and Models of the Patent Office, which will be found, also, to contain various provisions tending to secure the rights of bona fide inventors. For whatever there is of good in this law, and we think that there is much that is so, the public are indebted to the indefatigable exertions of the Hon. John Ruggles, of the Senate of the United States, who has devoted himself to this subject with equal zeal and success, from the inception of the bill, to its final signature by the President, at the moment before his term of office expired.

AN ACT,

In addition to the act to promote the progress of science and useful arts.

And be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person who may be in possession of, or in any way interested in, any patent for an invention, discovery, or improvement, issued prior to the fifteenth day of December, in the year of our Lord one thousand eight hundred and thirty-six; or in an assignment of any patent, or interest therein, executed and recorded prior to the said fifteenth day of December, may, without charge, on presentation or transmission thereof to the Commissioner of Patents, have the same recorded anew in the Patent

Office, together with the descriptions, specifications of claim, and drawings annexed or belonging to the same; and it shall be the duty of the Commissioner to cause the same, or any authenticated copy of the original record, specification, or drawing which he may obtain, to be transcribed and copied into books of record to be kept for that purpose; and wherever a drawing was not originally annexed to the patent and referred to in the specification, any drawing produced as a delineation of the invention, being verified by oath in such manner as the Commissioner shall require, may be transmitted and placed on file or copied as aforesaid, together with the certificate of the oath; or such drawings may be made in the office, under the direction of the Commissioner, in conformity with the specification. And it shall be the duty of the Commissioner to take such measures as may be advised and determined by the Board of Commissioners provided for in the fourth section of this act, to obtain the patents, specifications, and copies aforesaid, for the purpose of being so transcribed and recorded. And it shall be the duty of each of the several clerks of the Judicial Courts of the United States, to transmit, as soon as may be, to the Commissioner of the Patent Office, a statement of all the authenticated copies of patents, descriptions, specifications, and drawings of inventions and discoveries made and executed prior to the aforesaid fifteenth day of December, which may be found on the files of his office; and also to make out and transmit to said Commissioner, for record as aforesaid, a certified copy of every such patent, description, specification, or drawing, which shall be specially required by said Commissioner.

Sec. 2. *And be it further enacted*, That copies of such record and drawings, certified by the Commissioner, or, in his absence, by the chief clerk, shall be prima facie evidence of the particulars of the invention and of the patent granted therefor, in any judicial court of the United States, in all cases where copies of the original record or specifications and drawings would be evidence without proof of the loss of such originals; and no patent issued prior to the aforesaid fifteenth day of December shall after the first day of June next, be received in evidence in any of the said courts in behalf of the patentee or other person who shall be in possession of the same, unless it shall have been so recorded anew, and a drawing of the invention, if separate from the patent, verified as aforesaid, deposited in the Patent Office; nor shall any written assignment of any such patent, executed and recorded prior to the said fifteenth day of December, be received in evidence in any of the said courts in behalf of the assignee or other person in possession thereof, until it shall have been so recorded anew.

Sec. 3. *And be it further enacted*, That whenever it shall appear to the Commissioner that any patent was destroyed by the burning of the Patent Office building on the aforesaid fifteenth day of December, or was otherwise lost prior thereto, it shall be his duty, on application therefor by the patentee or other person interested therein, to issue a new patent for the same invention or discovery, bearing the date of the original patent, with his certificate thereon that it was made and issued pursuant to the provisions of the third section of this act, and shall enter the same of record: *Provided however*, That before such patent shall be issued, the applicant therefor shall deposite in the Patent Office a duplicate, as near as may be, of the original model, drawings, and description, with specification of the invention or discovery, verified by oath, as shall be required by the Commissioner; and such patent and copies of such drawings and descriptions, duly certified, shall be admissable as evidence in any judicial court of the United States, and shall protect the rights of the patentee, his administrators, heirs, and assigns, to the extent only in which they would have been protected by the original patent and specification.

Sec. 4. *And be it further enacted*, That it shall be the duty of the Commissioner to procure a duplicate of such of the models destroyed by fire on the aforesaid fifteenth day of December, as were most valuable and interesting, and whose preservation would be important to the public; and such as would be necessary to facilitate the just discharge of the duties imposed by law on the Commissioner in issuing patents, and to protect the rights of the public and of patentees in patented inventions and improvements: *Provided*, That a duplicate of such models may be obtained at a reasonable expense: *And provided, also*, That the whole amount of expenditure for this purpose shall not exceed the sum of one hundred thousand dollars. And there shall be a temporary board of Commissioner, to be composed of the Commissioner of the Patent Office and two other persons to be appointed by the President, whose duty it shall be to consider and determine upon the best and most judicious mode of obtaining models of suitable construction; and, also, to consider and determine what models may be procured in pursuance of, and in accordance with, the provisions and limitations in this section contained. And said commissioners may make and establish all such regulations, terms, and conditions, not inconsistent with law, as in their opinion, may be proper and necessary to carry the provisions of this section into effect, according to its true intent.

Sec. 5. *And be it further enacted*, That whenever a patent shall be returned for correction and re-issue under the thirteenth section of the act to which this is additional, and the patentee shall desire several patents to be issued for distinct and separate parts of the thing patented, he shall first pay, in manner and in addition to the sum provided by that act, the sum of thirty dollars for each additional patent so to be issued: *Provided, however*, That no patent made prior to the aforesaid fifteenth day of December, shall be corrected and re-issued until a duplicate of the model and drawing of the thing as originally invented, verified by oath as shall be required by the Commissioner, shall be deposited in the Patent Office. Nor shall any addition of an improvement be made to any patent heretofore granted, nor any new patent be issued for an improvement made in any machine, manufacture, or process, to the original inventor, assignee, or possessor of a patent therefor, nor any disclaimer be admitted to record, until a duplicate model and drawing of the thing originally intended, verified as aforesaid, shall have been deposited in the Patent Office, if the Commissioner shall require the same; nor shall any patent be granted for an invention, improvement, or discovery, the model or drawing of which shall have been lost, until another model and drawing, if required by the Commissioner, shall, in like manner, be deposited in the Patent Office; and in all such cases, as well as in those which may arise under the third section of this act, the question of compensation for such models and drawings, shall be subject to the judgment and decision of the Commissioners provided for in the fourth section, under the same limitations and restrictions, as are therein prescribed.

Sec. 6. *And be it further enacted*, That any patent hereafter to be issued, may be made and issued to the assignee or assignees of the inventor or discoverer, the assignment thereof being first entered of record, and the application therefor being duly made, and the specification duly sworn to by the inventor. And in all cases hereafter, the applicant for a patent shall be held to furnish duplicate drawings, whenever the case admits of drawings, one of which to be deposited in the office, and the other to be annexed to the patent, and considered a part of the specification.

Sec. 7. *And be it further enacted*, That, whenever any patentee shall have, through inadvertence, accident or mistake, made his specification of claim too broad, claiming more than that of which he was the original or first inventor, some material and substantial part of the thing patented being truly and justly his own, any such patentee, his administrators, executors, and assigns, whether of the whole or of a sectional interest therein, may make disclaimer of such parts of the thing patented, as the disclaimant shall not claim to hold by virtue of the patent or assignment, stating therein the extent of his interest in such patent; which disclaimer shall be in writing, attested by one or more witnesses, and recorded in the Patent Office, on payment by the person disclaiming, in manner as other patent duties are required by law to be paid, of the sum of ten dollars. And such disclaimer shall thereafter be taken and considered as a part of the original specification, to the extent of the interest which shall be possessed in the patent or right secured thereby, by the disclaimant, and by those claiming by or under him subsequent to the record thereof. But no such disclaimer shall affect any action pending at the time of its being filed, except so far as may relate to the question of unreasonable neglect or delay in filing the same.

Sec. 8. *And be it further enacted*, That,

whenever application shall be made to the Commissioner for any addition of a newly discovered improvement to be made to an existing patent, or whenever a patent shall be returned for correction and re-issue, the specification of claim annexed to every such patent shall be subject to revision and restriction, in the same manner as are original applications for patents; the Commissioner shall not add any such improvement to the patent in one case, nor grant the reissue in the other case, until the applicant shall have entered a disclaimer, or altered his specification of claim in accordance with the decision of the Commissioner; and in all such cases, the applicant if dissatisfied with such decision, shall have the same remedy and be entitled to the benefit of the same privileges and proceedings as are provided applicat.onsoriginal case of by law in the for patents.

Sec. 9. *And be it farther enacted*, Any thing in the fifteenth section of the act of which this is additional to the contrary notwithstanding, That, whenever by mistake, accident, or inadvertence, and without any wilful default or intent to defraud or mislead the public, any patentee shall have in his specification claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was not the first and original inventor, and shall have no legal or just right to claim the same, in every such case the patent shall be deemed good and valid for so much of the invention or discovery as shall be truly and bona fide his own, provided it shall be a material and substantial part of the thing patented, and be definitely distinguishable from the other parts so claimed without right as aforesaid. And every such patentee, his executors, administrators, and assigns, whether of a whole or a sectional interest therein, shall be entitled to maintain a suit at law or in equity on such patent for any infringement of such part of the invention or discovery as shall be bona fide his own as aforesaid, notwithstanding the specification may embrace more than he shall have any legal right to claim. But, in every such case in which a judgment or verdict shall be rendered for the plaintiff, he shall not be entitled to recover costs against the defendant, unless he shall have entered at the Patent Office, prior to the commencement of the suit, a disclaimer of all that part of the thing patented which was so claimed without right: *Provided, however*, That no person bringing any such suit shall be entitled to the benefits of the provisions contained in this section who shall have unreasonably neglected or delayed to enter at the Patent Office, a disclaimer as aforesaid.

Sec. 10. *And be it further enacted*, That the Commissioner is hereby authorized and empowered to appoint agents in not exceeding twenty of the principal cities or towns in the United States, as may best accommodate the different sections of the country, for the purpose of receiving and forwarding to the Patent Office all such models, specimens of ingredients and manufactures, as shall be intended to be patented or deposited therein, the transportation of the same to be chargeable to the patent fund.

Sec. 11. *And be it further enacted*, That, instead of one examining clerk, as provided by the second section of the act to which this is additional, there shall be appointed, in manner therein provided, two examining clerks, each to receive an annual salary of fifteen hundred dollars; and also an additional copying clerk, at an annual salary of eight hundred dollars. And the Commissioner is also authorized to employ, from time to time, as many temporary clerks as may be necessary to execute the copying and draughting required by the first section of this act, and to examine and compare the records with the originals, who shall receive not exceeding seven cents for every page of one hundred words, and for drawings, and comparison of records with originals, such reasonable compensation as shall be agreed upon or prescribed by the Commissioner.

Sec. 12. *And be it further enacted*, That, whenever the application of any foreigner for a patent shall be rejected and withdrawn for wnta of novelty in the invention, pursuant to the seventh section of the act to which this is additional, the certificate thereof of the Commissioner shall be a sufficient warrant to the Treasurer to pay back to such applicant two-thirds of the duty he shall have paid into the Treasury on account of such application.

Sec. 13. *And be it further enacted*, That, in all cases in which an oath is required by this act, or by the act to which this is additional, if the person of whom it is required shall be conscientiously scrupulous of taking an oath, affirmation may be substituted therefor.

Sec. 14. *And be it further enacted*, That all monies paid into the Treasury of the United States for patents and for fees for copies furnished by the Superintendent of the Patent Office prior to the passage of the act to which this is additional, shall be carried to the credit of the patent fund created by said act; and the monies constituting said fund shall be, and the same are hereby, appropriated for the payment of the salaries of the officers and clerks provided for by said act, and all other expenses of the Patent Office, including all the expend tures provided for by this act; and also, for such other puposes as are or may be hereafter specially provided for by law. And the Commissioner is hereby authorized to draw upon said fund, from time to time, for such sums as shall be necessary to carry into effect the provisions of this act, governed, however, by the several limitations herein contained. And it shall be his duty to lay before Congress, in the month of January, annually, a detailed statement of the expenditures and payments by him made from said fund.

And it shall also be his duty to lay before Congress, in the month of January, annually, a list of all patents which shall have been granted during the preceding year, designating, under proper heads, the subjects of such patents, and furnishing an alphabetical list of the patentees, with their places of residence; and he shall also furnish a list of all patents which shall have become public property during the same period; together with such other information of the state and condition of the Patent Office, as may be useful to Congress or to the Public.

Approved, March 3d. 1837.

From the New-York Farmer.

Poppy Seed Oil.—Many of our readers will probably recollect that we published a communication in the January No. of the Farmer on the subject of *Poppy Seed Oil.* The facts set forth in that communication attracted the attention of some of our readers, who take a deep interest in the introduction of new branches of industry; and we, at their request, applied to the writer of the communication referred to for more particular information in relation to the mode of cultivation; and we are now gratified to be able to publish the following communication from a gentleman whose statements may be fully relied upon. For this very interesting communication, and the capsules containing some of the seed, which we shall plant with great care, he will please to accept of our thanks, and the numbers of the Farmer which we forward to him. We shall look with much interest for further communications on this subject from the same pen, and also in relation to the cultivation of *Madder*. If convenient we should be much obliged to Mr. Bishop, at a suitable time, for a few seeds, or roots of the Madder to plant.

For the New-York Farmer.

Mr. Minor.—Dear Sir: Your letter of the 10th inst. to E. S. Scripture, has been handed me, with a request to answer your several inquiries in relation to the cultivation of the Poppy and Madder. You inquire, 1st. What kind of Poppy is best? 2d. What kind of soil is the best? 3d. How do you plant or sow it? 4th. At what time should it be planted or sowed? 5th. How much seed to the acre? 6th. How do you cultivate it? 7th. How do you gather it? &c., &c. As I have some practical knowledge of its cultivation, I cheerfully answer the above inquiries, so far as my experience and information enable me to do. In answer to the first inquiry, I send you some of the seed capsules, containing the seed. This species of the Poppy, having imperforate seed capsuls, appears altogether the best adapted for cultivation for obtaining seed, as you will readily perceive, on examination, as the perforate, or open seed capsules, would render the gathering of the crop tedious and expensive.

2d. This species of the Poppy has a very general adaptation to all the different soils usually met with in this State. Yet when cultivated as a field crop, for the purpose of

obtaining oil from the seed, it should have a warm dry soil,—either sand and loam, or loamy gravel. Planted on a deep, moist, and very rich soil, it continues to shoot up lateral branches which bud and blossom until killed by very severe frosts. Under such circumstances, we can never have that perfect and simultaneous maturity of the bolls which is necessary to obtain a good crop of seed. This difficulty, however, can be obviated in a great measure, if not entirely, by the method of sowing and cultivation mentioned in answering your 3d inquiry.

3d. Sow the seed in drills, eight inches apart, and four inches in the drill, with as light a covering as practicable. If the weather be damp and rainy immediately after sowing, the seed will vegetate in a few days. The objections to sowing broad cast are, that much of the seed is covered too deep if the common harrow is used, and that so small a portion of it has an equal covering of earth, the crop will never be uniformly ripened. Those seeds having a deep covering either not vegetating at all, or so late in the season that some part of the crop will be fit for harvesting, while another is in blossom, and another with the bud in embryo. This was the case with a field sowed broad-cast, on a deep rich alluvial soil, and was never harvested, winter setting in while a portion of the crop was in blossom, and another in the bud. I have a hand drill, of different construction from any I have examined. It sows the poppy seed with the most perfect accuracy, dropping just one or two seeds at a time. I may, at some future period, send you a drawing of it. Another objection to sowing broad-cast is, the utter impossibility of making a uniform distribution of seed. If however this method *is* practised, the seed should be sown just before rain, having the surface of the field made as smooth and level as may be, and no covering attempted.

4th. Sow the seed as early in the season as a good preparation of the soil can be made.

5th. An acre, with the distances before mentioned, will contain 196,020 plants, and unless there be an unnecessary waste of seed, one pint will prove sufficient for an acre.

6th. The growth of the plant will be so rapid as not to require, or even admit, of much cultivation. The plants should be thinned out when small, and all luxuriant weeds removed that would interfere with, or check their growth. The poppy is very hardy,—not liable to be destroyed by any insects, or injured by early frosts.

7th. Reap it as you do wheat, and bind in bundles. Thresh it upon the barn floor, (which should be very tight,) in the same manner as wheat, and separate the seed from the broken capsule and stalks with a wire seive.

The oil may be extracted in the same manner as from flax seed—and the roller and plate used in the first operation upon flax seed is well adapted for poppy seed After it has passed through the rollers, a portion of the oil may be taken out for table use—and the cake then broken up, and ground under the stone in the same manner as flax seed—and, after heating in the cylinder, the remainder of the oil may be expressed. The cold expressed oil is very valuable for many purposes. The genuine Macassar oil for improving and beautifying the human hair is the oil of poppy seed. The article is often counterfeited at present, by substituting fine olive oil for the poppy. This deception may be detected in cold weather—the olive oil loosing entirely its fluidity, while the poppy oil is not in the least affected by the most intense degrees of cold.

The quantity of seed an acre of land will produce, must depend very much on the soil and cultivation. If the plants stand singly upon a good soil the distances above mentioned, each one will produce from 4 to 7 heads, or seed capsules, averaging throughout the field 5 to every plant, making 980.100 to the acre. Of those I raised last season, 12 often produced one gill of seed—but this was measured before it was *quite* dry—so that in estimating the average quantity, we will say 25 heads to the gill. This calculation would give the enormous quantity of 150 bushels of seed to the acre.

The experiment has not been made on an acre of ground, which it must be acknowledged is the fairest way of testing the productiveness of *any* crop – but it will be found *practically true*, that an acre of good land, well fitted, will produce 196,020 poppy plants, of vigorous growth, averaging 5 seed capsules each—and in proof of the quantity of seed they contain, you have but to examine those I send you. I shall be able to furnish you with the results of further experiments, as early as the coming October, and will send you some of the seed capsules entire—that you may distribute them among your friends if they are not supplied. In concluding my remarks, for the present, I will say, that, although the enormous quantity of 150 bushels of seed to the acre, will not often, if ever, be realized by the cultivator, owing to negligence and inattention—yet one half the quantity will render this business one of the most profitable branches of agriculture—the value of the seed being at present not less than $2.50 per bushel. In regard to Madder—I have an acre under cultivation, and have availed myself of most of the practical knowledge of our farmers in this region on this subject. I must defer any communication on this subject for a few weeks—probably until after the first *laying* or *soiling*, as I anticipate some innovations upon the customs of our farmers in this matter.

L. Bishop.

Sauquoit, Oneida Co., May 4, 1837.

From the Scientific and Literary Journal.

PRECIOUS STONES.

Gems, or precious stones, as they are frequently called, are for the most part transparent, and have a vitreous or glassy appearance. Their different colors are occasioned by metallic oxydes of various kinds with which they are impregnated, Some writers have classed them by their colors, but this is a very uncertain mode, since different gems have not unfrequently the same color, and in many cases, the same gems are of different colors. The usual distinction of gems into oriental and occidental is also liable to error, since the best gems, from whatever part of the world they are brought, are always called oriental. The most estimable of all the species are the diamond, ruby, emerald, and sapphire. The amethyst, topaz, and aqua marine are considered of nearly equal value with each other; and the garnet is the cheapest of precious stones.

The ancients engraved upon several kinds of gems, but they appear to have been ignorant of the art of cutting the diamond, the ruby, and the sapphire, which were too hard for them to operate upon. The emerald and the opal were too highly esteemed as precious stones to have often found their way into the hands of engravers. The garnet was often engraved upon, and there are many master-pieces of the art in chalcedony and cornelian. Onyx and sardonyx were employed for that species of engraving in relief called cameos; and in many instances, it is pleasing to observe with what dexterity the ancient artists availed themselves of the different colors in the alternate zones to express the different parts and shades of their figures.

DIAMONDS.

The diamond, or adamant of the ancients, which, by universal consent, has been placed at the head of the mineral kingdom, is the hardest of all bodies, and, when pure, is perfectly transparent, like crystal, but infinitely more brilliant.

The best are brought from the East Indies; and the principal mines are those of Raolconda and Coulour, in the province of Golconda; and that of Soumelpour, or Goual, in Bengal. At Raolconda they are found in deep crevices of the rocks. Persons, by means of long iron rods, with hooks at the ends, draw out from these crevices the loose contents, and afterwards wash them in tubs, for the purpose of discovering the diamond.

As soon as all the earthy particles have been washed away, the gravel-like matter that remains is raked together, the stones are thrown out, and what diamonds happen to be present are found among the refuse that is left.

In order to ascertain whether a stone which has been found be really a diamond, the workmen have a mode of placing it upon a hard substance, and striking it with a hammer. If it resist the blow, or seperate into leaves. it must be a diamond ; but, in the latter case, the discovery is made at an immense expense, since by thus diminishing the size, its value must also, of course, be greatly diminished.

When the diamond is rubbed, it will attract bits of straw, feathers, hairs, and other small objects ; and if exposed to the rays of the sun, and immediately taken into a dark place, will appear luminous.

CHRYSOLITE.

Chrysolite is the softest of all the gems, and usually of yellowish green color, though sometimes it is grass green, or bluish green, but with a tinge of brown.

Though scarcely harder than glass, and consequently inferior to most other gems in lustre, these stones are not unfrequently used in jewelry, particularly for necklaces and ornaments for the hair ; and when well matched in color, and properly polished, their effect is very good. They are, however, too soft for ring stones.

This stone is imported from the Levant, and is said to be found in Upper Egypt.

GARNET.

This stone is found abundantly in many mountains of different parts of the world. But those of the hardest and best quality are brought from Bohemia, where there are regular mines of garnets; and a great number of persons are there employed in collecting, cutting and boring them. The boring is performed by means of an instrument, having a diamond at its extremity, which is rapidly turned by a bow.

Garnets vary much in size, some of them being upwards of an inch in diameter, and others not larger than a pin's head. Generally speaking, they are stones of inferior value.

In comparison with the ruby, those even of finest quality have a very sombre appearance. The kinds most esteemed are such as have a clear and intense red color, or a rich violet or purplish tinge. The latter are called *Syrian garnets*, not from the country of that name, as is usually supposed, but from the word *soranus* which signifies a *red stone*,

The best garnets are cut, in the manner of other precious stones, and set upon a foil of the same color ; but some are cut into beads, and strung for necklaces.

SAPPHIRE.

The oriental sapphire is a gem of blue color, the shades of which vary, from a full and deep tint to a nearly colorless appearance.

We are chiefly indebted for the sapphire to the East Indies and the island of Ceylon, where it is found among the sand of the rivers.

In hardness the sapphire ranks next to the ruby, and in value it is about equal to the emerald. In the Museum of Natural History at Paris, there is a sapphire which weighs upwards of sixty-six carats, and which was placed there from the wardrobe of the crown.

It is said that sapphires lose their color in the fire, and that, after having been subjected to heat, they are so hard and transparent as sometimes to be sold for diamonds.

RUBY.

Oriental ruby is a precious stone of very intense and bright red color, occasionally varied with blue, and sometimes partically colored.

The ruby is imported into this country from the East Indies, though seldom in a rough state, since the stones are almost always first cut by the Indians for the purpose of ascertaining their value. They are said to be found in the sand of certain streams near the town of Sirian, the capital of Pegu ; and with sapphires in the sand of the rivers of Ceylon.

The hardness of this stone is such that the ancients do not appear to have possessed the art of cutting it ; and in the improvements which have of late been made in the construction of time-keepers, no stones have been found sufficiently hard for jewelling the holes, except the ruby and the diamond.

AMETHYST.

The amethyst was a gem well known to the ancient Greeks and Romans, and held by them in great esteem. Its name is derived from the Greek language, and implies a power of preventing intoxication, which, originating no doubt in the resemblance of its color to that of wine, and the absurd doctrine of sympathies, it was believed by the ancients to possess They ascribe to it many other virtues equally surprising and equally absurd, particularly that the wearing of it would expel melancholy, procure the confidence and friendship of princes, render people happy, and even dispel storms of wind and hail. The ancients frequently engraved upon the amethyst ; and their favorite subject was the representation of Bacchus and his followers.

Persons accustomed to make imitations of the precious stones find the amethis one of the easiest to be counterfeited.

TOPAZ.

The topaz is a gem usually of a wine yellow color, but sometimes orange, pink, blue, and even colorless like rock crystal.

The word topaz is derived from an island in the Red Sea, where the ancients found a stone, but very different from ours, which they denominated topaz. The best, are of deep color, which are imported from Brazil; and the most brilliant are supposed to be those of Saxony ; but the latter are generally of very pale color. This species of gem is also found in Siberia and other countries. It is often defective in transparency, and sometimes even opaque.

It is a somewhat singular circumstance, that if the topaz of Saxony be gradually exposed to a strong heat in a crucible, it will become white ; and, on the contrary, that the Brazilian topazes by the same process become red or pink. The latter are not unfrequently sold, as natural stones of this color, by the name of *pink topazes* and *Brazilian rubies*.

The *blue topaz* is a rare Brazilian gem, which varies in size from one or two carats to two or three ounces. The *white topaz* is perfectly colorless. This stone, which generally occurs of small size, is in considerable estimation in Brazil. It is usually employed in circular ear-rings, or for the purpose of being set round yellow topazes.

EMERALD.

The emerald is a well known gem of pure green color. By the ancients it was in great request, particularly for engraving upon. They are said to have procured it from Ethiopia and Egypt. The most intensely colored and valuable emeralds that we are acquainted with are brought from Peru.

The emerald is one of the softest of the precious stones ; and is almost exclusively indebted for its value to its charming color. The brilliant purple of the ruby, the golden yellow of the topaz, the celestial blue of the sapphire, are all pleasing tints ; but the green of the emerald is so lovely, that the eye, after glancing over all the others, finds delight in resting upon this.

The largest emerald that has been mentioned, is one said to have been possessed by the inhabitants of the Valley of Manta in Peru, at the time when the Spaniards first arrived there. It is recorded to have been as big as an ostrich's egg, and to have been worshipped by the Peruvians, under the name of the Goddess, or Mother of Emeralds. They brought smaller ones as offerings to it, which the priests distinguished by the appellation of daughters. Many fine emeralds are stated to have been formerly bequeathed to different monasteries on the continent ; but the greater part of them are said to have been sold by the monks, and to have had their place supplied with colored glass imitations. These stones are seldom seen of large size, and at the same time entirely free from flaws.

The emerald, if heated to a certain degree, assumes a blue color ; but it recovers its own proper tint when cold. When the heat is carried much beyond this, it melts into an opaque colored mass.

AQUA MARINE.

The beryl, or aqua marine, is a light or mountain green variety of the emerald, sometimes straw colored, bluish, yellow, or even white.

These stones are of such frequent occurrence, even in large pieces, perfectly clear and free from flaws, and in general so soft, and have so little the brilliancy of other gems, that they are generally considered of very inferior value. The most beautiful kinds are brought from Dauria, on the frontiers of China, from Siberia, and from Brazil.

TOURMALINE.

The tourmaline is a stone belonging to the same family as the emerald, and generally of a smoky blackish color, though it is sometimes green, red, blue, or brown.—When not very thick, it is transparent.

This stone was first made known in Europe about the beginning of the last century, by the Dutch merchants, who brought it from the island of Ceylon, where it is principally found. When strongly heated, it becomes electric; one of the summits of the crystal negatively, and the other positively. An early writer by whom it is mentioned, says that "it has the property not only of attracting ashes from the warm or burning coals, but that it also repels them again, which is very amusing: for as soon as a small quantity of ashes leap upon it, and appears as if endeavoring to writhe themselves by force into the stone, they in a little time spring from it again, as if to make a new attempt. It was on this account that the Dutch called it the ashes drawer."

When laid on the table, the tourmaline appears dark and opaque; but when held against the light, it has generally a pale brownish hue. It is sometimes cut, polished and worn as a gem; but on account of the muddiness of its colors, is not in general much esteemed. Those persons who wear tourmalines set in rings, consider them more as objects of curiosity than of elegance: they show them as small electrical instruments, which it is only necessary to expose for a little while to the heat of a fire, to make them attract and repel light bodies, to the amusement of all who are unacquainted with their qualities.

CORNELIAN.

Cornelian is another kind of agate, usually of a red or flesh color, though sometimes white, orange or yellow.

On several of the British shores, cornelians are found with other pebbles; but the most beautiful and valuable kinds are imported from the East Indies. These are sometimes so large as to measure nearly three inches in diameter. The kinds principally in request are those of pure white and bright red color; and jewellers have the art of changing the color of the yellow varieties to red, by heat.

No stone is so much in request for seals, as the cornelian: it is likewise cut into beads for necklaces, and stones for ear-rings; into crosses, bracelets, and other trinkets, which in India form a considerable branch of traffic.

ONYX.

Onyx is a kind of agate, marked alternately with white and black, or white and brown. Its name is derived from the Greek language, and has been given on account of its resemblance in color to the whitish band at the base of the human nail. The distinction which appears to be made betwixt *onyx* and *sardonyx*, arises from the colors of the former being arranged either concentrically, or in a somewhat confused manner, and those of the latter in regular stripes or bands.

Both these kinds are highly esteemed by lapidaries, for the formation of vases, snuff-boxes, and trinkets of various kinds. Of the sardonyx the ancients made those beautiful cameos, many of which still ornament our cabinets.

The onyx is imported from the East Indies, Siberia, Germany, and Portugal.

OPALS.

Opals are a semi-transparent kind of stones, which have a milky cast, and when held betwixt the eye and the light, exhibit a changeable appearance of color.

There are in Hungary some quarries or mines from which, about four centuries ago, opals were obtained in such abundance, that upwards of three hundred persons were employed in them. These quarries still produce opals, some of which are so valuable as to pass in commerce under the appellation of *oriental opals*, whilst others are so poor as to be of no value whatever to the jeweller. Opals are also found in other parts of Europe, and in the island of Sumatra, and several parts of the East Indies.

Few precious stones are more beautiful than opals. Their elegant play of colors, brilliant blue, green, red and yellow, variously modified, have procured for them a distinguished rank among the gems. Notwithstanding this, they are but ill suited to the purposes of jewelry. on account of their softness, their great frangibility, and their sometimes splitting on a change of temperature. By the Turks they are so peculiarly esteemed, that a fine opal of moderate size has been sometimes sold at the price of a diamond. The esteem in which they were held among the ancients Romans was such, that Nonius, the Roman senator, is stated to have preferred banishment to parting with a favorite opal which Mark Anthony was anxious to possess.

In the abbey of St. Denys, near Paris, there was formerly a curious ancient opal, which was green on the outside, and when viewed against the light, exhibited a fine ruby color.

In the purchasing of opals, great caution is requisite, since fine glass pastes have not unfrequently been substituted for them, and sold at enormous prices.

Hydrophane, or *oculus mundi*, is a kind of opal, the distinguishing characteristics of which is, that it gradually becomes transparent by immersion in water. It is either of a whitish brown, yellowish, green, milky grey, or yellow color, and opaque. The name of *oculus mundi* has been given to these stones from an internal spark, or luminous spot, which changes its position according to the direction in which they are held to the light. The countries in which they are chiefly found are Hungary and Iceland.

The phenomena of their becoming transparent in water, is supposed to be occasioned by that fluid soaking through their whole substance, in the same manner as the transparency of paper is occasioned by the immersing it in oil. When taken out of the water, these stones, as they dry, become again opaque.—[Bingley's Useful Knowledge.]

NEW LAMP.—A lamp of a new construction, which describes a circle of light of about thirty feet in diameter, of the apparent intensity of sunshine, showing the objects within its sphere as distinctly as on the table of a camera obscura, has been erected at the head of the inclined plane in St. Leonard's depot. Its object is to enable the engine-man to a distinct view of the inclined ropes during the night, and this has been fully attained. The lamp consists of an Argand burner, placed in the focus of a large speculum, of a peculiar form, by which the whole light is distributed just on the space where it is required. It is computed that the light on the above space is equal to that of twenty-five or thirty similar burners in common lamps. A lamp of this kind we have no doubt would be useful for other purposes. It appears to us that the largest assembly-rooms might be brilliantly lighted by one placed at each end of the room, and one would be sufficient to light the stage of a theatre. The cost of this one is said to be about £200 but we understand it saves an annual expense of about half that sum. The inventor is a Mr. Rankin, and he names it the conoidal lamp, probably because the light is thrown from it in the form of a cone.—[Caledonian Mercury.]

GALVANISM.—Dr. Charles G. Page, of Salem, Mass., has lately made the valuable discovery that iron, lead, or any metal, may be substituted for the expensive article of copper in galvanic batteries, whereby the cost of this apparatus will be diminished by about one-half. In order that a battery of this construction should equal one of copper and zinc, it is necessary that the exciting liquid should be some acid, holding the oxide of copper in solution, such as the nitrate or sulphate of copper. A solution of blue vitriol or the sulphate of copper, is preferable from its cheapness. A small plate of lead and zinc, each the size of a cent, immersed in a wine glass of the above solution, will give bright sparks, strong shocks, and produce decompositions when connected with a spiral coil of copper ribon three hundred and twenty feet long, which is, for convenience, now generally called a dynamic multiplier. The superior action of such batteries appears to be owing to the greater readiness with which copper deposits upon another metal than itself. He has further found that a tolerably good battery may be made of one metal only, viz. zinc, provided one of the plates much exceeds the other in size, and the sulphate of copper be used as the exciting liquid. To construct a battery of this description, a number of narrow strips of sheet zinc, arranged in the form of a cylinder, are immersed in a cylinder of zinc containing a solution of the sulphate or nitrate of copper; the zinc strips answering merely for conductors.

Among other discoveries lately made by Dr. Page in relation to this subject, we notice the production of sparks and shocks from a thermo-electric apparatus, consisting of a pair of bismuth and antimony plates heated by a spirit lamp. This condition has hitherto been wanting to establish fully the identity of thermo-electric, with common galvanic currents.

FALL OF FISHES FROM THE ATMOSPHERE IN INDIA; BY M PRINSEP.—The fact that fishes fall from the atmosphere in the rainy season, however incredible it may appear, has been so frequently attested by credible witnesses that it can scarcely be doubted. As for myself, my credulity is compelled to yield to the discovery I made one day of a small fish, in my

pluviometer, which was situated on an isolated pile of stones about five feet high in my garden at Benares. A note from M. Cameron informs me that a rain of fishes occurred on the 19th of February, 1830 near Feridpoor. This fact was asserted before a magistrate, by many ocular witnesses, and it was their concurring testimony that towards noon of the above mentioned day, the sky was obscured, the rain commenced to fall, and shortly after, fishes of various sizes fell from the atmosphere. A large number were collected by several witnesses; some were found destitute of a head, and commenced to putrefy; others were entire and fresh, but no one dared to eat them.—[Bib. Universelle, No. 3, Mars, 1836.]

Agriculture, &c.

BEET SUGAR MANUFACTORY.—We have published occasionally statements in relation to the Beef culture for the manufacture of Sugar; but seldom any thing in relation to the manufacture of the Sugar. We therefore now give a concise description of that process. We give it for the purpose of dispelling the idea, which many entertain, that the process of manufacture is a complicated and difficult one; when in truth it is about as simple as the manufacture of *Maple* Sugar.

[From the Silk Culturist.

PROCESS OF MAKING BEET SUGAR.

The attention of the public having been some time drawn to the manufacture of sugar from the beet, and having repeatedly recommended its cultivation to farmers as a profitable crop, we have felt ourselves under an obligation to give them the details of the process by which it is extracted. We have, therefore, examined the best authorities on the subject, and consulted several gentlemen of some practical knowledge and experience in the business, and the result of our investigation is that the process is altogether more simple and less expensive than has generally been supposed. In describing the various processes in the manufacture, we have carefully avoided the use of chemical terms, and substituted language which we hope will be understood by every reader.

There are several varieties of the beet which yield sugar; but the Silesian beet is recommended as the best and most productive. This beet will come to maturity in all parts of the United States, up to the 45th degree of latitude. The soil most congenial to its growth is a light sandy loam, of good depth, and if free from stones, the better. Probably no country in the world is better adapted to the growth of this root than the alluvial meadows on the Connecticut and other rivers of New England. The cultivation, however, need not be confined to valleys, as in most of the hill towns, lands may be found well adapted to its growth. The land is prepared for the seed by deep ploughing and pulverizing the surface. This is best accomplished by ploughing in the fall, and leaving the land in furrows through the winter. In the spring, the land should be cross ploughed and harrowed, and, if the soil be light, it will be prepared to receive the seed. The seed may be sown as early as the season will admit, broad-cast, or in drills; but ultimately the plants should be from 12 to 18 inches apart. They should be hoed and kept free of weeds—at the second hoeing they should be thinned out, and but one plant left in the hill—the surplus plants may be transplanted to vacant places in the field.

In the extraction of the sugar, the beets must first be cleaned by washing or scraping with a knife, and care be taken that all decayed parts be cut off. They must then be passed through the rasper and be reduced to a pulp—the finer they are rasped the better, as it facilitates expressing the juice. The pulp must then be put into cloth bags, and have the juice pressed out by a screw press. In France they use the hydraulic press; but a cider, or other press, will answer the purpose, and be attended with much less expense. As decomposition commences soon after the beet is out of the ground, and progresses rapidly, no time should be lost in converting them into sugar.

After the juice is expressed, and before it is converted into sugar, it must undergo four distinct and different processes. 1. Defecation. 2. Evaporation. 3. Clarification. 4. Concentration.

Defecation.

The composition of the beet juice does not differ essentially from that of the cane—it combines with the saccharine matter small quantities of malic or acetic acid, wax and mucilage, which must be extracted before evaporation is commenced. The first process, therefore, is to purify the juice, which must be done by neutralizing the acid, decomposing the wax, and coagulating the mucilage, and hence is called defecation. All this may be done by heating and mixing with it the milk of lime in about the proportion of 46 grains troy weight to the gallon. The milk of lime is prepared by slaking quicklime with hot water, and reducing it to the consistence of cream. The juice must be heated to about 160 degrees of Fahrenheit, and the milk of lime poured into it and thoroughly mixed by stirring with a stick. After it is intimately mixed, the stirring must be stopped, and the mixture suffered to rest for a short time. It must then be heated to the boiling point, which will throw the impurities upon the surface in the form of scum, when the boiling must be stopped. When the juice has become clear it must be drawn off from below, by means of a cock, or the scum must be skimmed off from the top—care being taken in either case to effect a complete separation.

Evaporation.

The next process in the manufacture is to dissipate the water, which is done by "boiling away," as it is commonly called, but in technical language, evaporation. If in the process of defecation an excess of lime has been used it should be extracted. This may be done by a mixture of sulphuric acid and water, in the proportion of one of the former to forty-four of the latter. This mixture, put in contact with the lime, causes an effervescence, by which the lime is thrown off, and the cessation of which is a sure evidence that the lime is neutralized. Some manufactures say that a small portion of lime should be allowed to remain, and others that the whole should be neutralized. As practical men differ on this point, we may safely conclude it is not very material.

The juice is boiled down till it is reduced to about one-fifth or one-sixth of its original quantity. For this purpose pans or kettles may be used; but it will be seen that those vessels which present the greatest surface to the fire, and give the least depth to the juice, will best facilitate evaporation. As the water evaporates, flaky substances will separate from the juice and collect in a white foam on the surface, which must be skimmed off as it appears. To promote their separation, the boiling is commenced with a moderate fire, which is subsequently increased as they disappear. Sometimes the white of eggs beaten, or a little blood, is added for the same purpose. During the boiling, the juice will rise in froth and flow over the top of the pan, unless prevented by occasionally throwing in a small quantity of some fatty substance. Butter is commonly used, but tallow, lard, &c. will answer the same purpose. It not only causes an immediate subsidence, but hastens evaporation.

Clarification.

After being defecated and evaporated, the juice is yet in a degree impure, and the object of the next process is to separate it from its remaining impurities, and hence is called clarification. This consists in filtering it through animal charcoal granulated [burnt bones broken to grains,] and is performed in the following manner. Tubs, or vats in the form of those used for leaching ashes are made of wood or metal, and furnished with a cock inserted near the bottom. The size of the vats is immaterial; but those of the following dimensions will be found most convenient—2 feet 8 inches deep—1 foot 8 inches diameter at the top, and 11 inches at the bottom. They may be four sided or round; but those made of staves and hooped with iron hoops we should think the cheapest, and on some accounts the best.

A strainer standing on legs, and covered with coarse cloth, must first be placed in the bottom of the vat and filled with the charcoal—about 100 pounds will be necessary for a vat of the above dimensions. The charcoal must then be covered with another strainer and cloth, and the vat filled with evaporated juice, or, as it is then called, sirup. After standing long enough to leach through the charcoal, the cock must be turned and the sirup be slowly drawn off, and the vat re-filled as fast as it is emptied. The charcoal must be changed twice a day; but it may be washed and reburnt, and, thus prepared, it will answer for another filtration. This may be repeated until it is consumed.

Concentration.

The next process is to solidify the sirup, and hence is called concentration. To accomplish this it must be again evaporated until it is brought into a proper state for crystalization. As it is important that evaporation should cease as soon as it art

rives at this point, Chaptal gives the following rules for ascertaining the fact. "1. Plunge a skimmer into the boiling sirup, and upon withdrawing it, pass the thumb of the right hand over its surface, mould the sirup which adheres to the thumb, between that and the fore-finger, till the temperature be the same as that of the skin—then separate the thumb and finger suddenly—if the boiling be not completed, no thread will be formed between the two; if there be a filament, the boiling is well advanced; and the process is completed as soon after as the filament breaks short, and the upper part, having the semi-transparency of horn, curls itself into a spiral. 2. The second mode of judging of the completion of the process is by observing the time when the sirup ceases to moisten the sides of the boiler, and then blowing forcibly into a skimmer which has just been immersed in it—if bubbles escape through the holes of the skimmer which ascend into the air in the same manner as soap bubbles do, the liquor is considered to be sufficiently boiled."

When the concentration arrives at this point, the sirup must be taken from the boiler and poured into large pans, for the purpose of cooling. The pans must be placed in the air, and the sirup occasionally stirred during the process of cooling, which will be completed in about two hours. On examination, the bottom and sides of the pan will be found covered with a thick bed of crystals, having but little consistence; on the surface of the sirup, a crust will also be formed. To promote crystalization, or, as it is more properly called, graining, a thin bed of brown sugar is sometimes put upon the bottom of the cooling pan, in order to make a nucleus about which the crystalized matter may gather.

After the sirup is cooled and crystalized, or grained, all that remains is to separate the sugar from the molasses, and it is fit for domestic consumption or market. To effect the separation, moulds, as they are called, must be prepared in the form of defecating vats, with the lower end drawn to a point, or so near a point as to leave a hole of three-fourths of an inch in diameter. These may be made of wood, metal or earthware, and their capacity may be regulated according to the convenience of the manufacturer. Those used in the sugar factories in France usually are large enough to contain five or six gallons They are also used in the refining process. Before using them, if of wood, they must be soaked several hours in water, and dried a short time before they are filled with sirup. Thus prepared, and with a cork in the hole at the point, they must be filled, or nearly filled, with crystalized sirup, and secured in an upright position, over a pan or tub of sufficient size to receive the quanity of molasses it contains. After standing from 12 to 36 hours, according to circumstances, the cork is withdrawn and the molasses permitted to drain off. It will at first drain off rapidly; but soon cease to flow in any considerable quantity. To hasten its separation from the sugar, which takes place slowly, the mass must be pierced with an iron spear, by thrusting it into the hole at the point, which will give it vent and cause it to drain off. This operation must be repeated as often as is necessary, and until all the molasses is extracted.

After having remained long enough to have the molasses run off, the sugar is detached from the sides of the mould with a knife, the moulds are set on the floor in a reversed position and left for two or three hours—when, by lifting from the floor and giving it a shake, the loaf will separate from the mould by force of its own weight. The head of the loaf will retain a degree of moisture and a portion of molasses, and, consequently, should be cut off, and thrown into the juice intended or the next clarification. The molasses, also, when a sufficient quantity is on hand, should be again concentrated in order to obtain all the crystalizable sugar it contains. By the foregoing processes the beet is converted into brown sugar, the kind which is consumed in the largest quantities in most families. In the manufacture of loaf, or lump sugar, there is another process called "refining;" but being foreign to our present purpose, we omit it.

From the Quarterly Journal of Agriculture.

STUDIES IN THE SCIENCE AND PRACTICE OF AGRICULTURE, AS CONNECTED WITH PHYSICS.

(Continued from page 335.)

Experiments on Feeding.—Some of the most instructive experiments upon the feeding of farm-stock with different materials, were made by an intelligent foreign agriculturist, M. Mathieu de Dombasles, and published in a work little known in this country, the *Annales de Roville.* The experiments usually made on this subject have been conducted upon the principle of continuing one species of food, such as hay or carrots, for a given time; but M. de Dombasles reflecting that it is neither natural nor agreeable to any animal to be confined for a length of time to the same species of food, adopted a different method. He separated into several groups the cattle on which he designed to experiment, and brought those in each group as nearly as possible to a given weight, by feeding them with an exactly weighed proportion of common articles of food, diversified to suit their taste. When he had proceeded so far, he then began to take away from their diversified food a known portion of one of them, such as lucern hay, (*luzerne seche,*) replacing it by some sort of root, such as carrots, gradually increased or diminished, so that each individual in the group came up to and sustained the weight it had stood at before the change. The comparison of the quantities thus ascertained by trial to be equivalent, gave the practical proportions of their nutritive properties, under the conditions thus associated.

The results thus obtained by M de Dombasles by trials with sheep, appeared to place carrots very far below the rank usually assigned to them as food for sheep by farmers on the Continent, and even as food for horses when substituted for grain. But it is important to remark, that M. de Dombasles gave the carrots in a raw state to his sheep and consequently from their stomachs being unable in the process of digestion to cause the globules in the carrot containing the dextrine to burst, they derived little nutriment from a substance which is undoubtedly very nutritive when the dextrine is developed by boiling. The intelligent farmers in Belgium, who seem to be almost a century before other parts of Europe in improvement, never, it is said, give any roots to their live stock without boiling.

The digestion of food is in all animals partly a chemical and partly a mechanical process, and varies much in different animals, even when they feed on similar aliment, for example, the rabbit, the horse, and the gamecock, when fed upon oats or barley. The horse, and even the rabbit, when fed on oats, swallow many grains without crushing them with their teeth, and their stomachs not being endowed with the power of digesting solid uncrushed grain, it is voided whole, and so little changed as frequently to be capable of germinating. In the case of the gamecock, again, and all gallinaceous fowls which feed on grain, it is uniformly swallowed whole, their bills not being adapted for bruising it like the teeth of the horse, nor for shelling it like the linnets and sparrows. But the gizzard of these fowls has not only sufficient power to crush oats and barley, but even, as Spallanzani proved, to reduce glass to powder; yet with all this power, so very much greater than the digestive powers of the horse, poultry cannot, as will immediately be proved, completely extract the dextrine from grain, unless assisted to do so by artificial means, besides their powers of digestion. The celebrated M. Reaumur undertook a series of experiments on raw and on boiled grain in feeding, which though made long before the discovery of dextrine, strongly corroborate the views of MM. Raspail and Biot, the more so, indeed, from M. Reaumur's non-acquaintance with the principle.

The farmers in France who keep poultry, have long been in the habit of cooking the grain given to fowls which they intend to fatten, boiling it in water till it is soft enough to be easily bruised between the fingers, the heat causing it to swell till the mealy portion of the grain splits the chaffy envelope, and this they term bursting. It is therefore the popular opinion, that boiled grain is more nutritive and fattening than raw grain, an opinion founded, however, upon vague notions, which M. Reaumur endeavored to base upon precise calculation.

Boiling of Grain.—For this purpose M. Reaumur caused about four measures (each 1½ pint English or ⅘ths of a chopin Scotch) of each of the six common sorts of grain, to be boiled till they were well burst, (which may be fairly taken to mean that two-thirds of the dextrine was set free,) and he found that the increase of bulk in each sort was as under:—

Four measures of oats, after being boiled to bursting, filled	7	measures.
Four measures of barley, after being boiled to bursting, filled	10	...
Four measures of buckwheat or brank, after being boiled to bursting, filled	14	...
Four measures of maize, after		

being boiled to bursting, filled above 13 ...
Four measures of wheat, after being boiled to bursting, filled little more than 10 ...
Four measures of rye, after being boiled to bursting, filled nearly 15 ...

Rice swells considerably more than any of the preceding, but was not measured.

In order to ascertain whether the boiling altered the preference of poultry for any of the particular sorts, M. Reaumur made experiments, varied in every possible way.—The fowls were furnished with two, three, four, five, and six different sorts, sometimes all the compartments of a feeding-box being filled with burst grain, each division differing from another, and sometimes each sort of grain filled two of the divisions, one having nothing but boiled, and another nothing but dry unboiled grain.

All that could be inferred from these repeated experiments was, that the greater number of fowls prefer boiled to raw grain, though there are many of them which show a preference to the raw grain on certain days, and no permanency could be discovered in the preference shown for any sort of burst grain. Some fowls, for instance, which one day preferred boiled wheat, would on other days, make choice of buckwheat or maize, oats or barley, and sometimes though more seldom, even of rye; but rye, either boiled or raw, is their least favorite sort of grain.

It follows as an important practical conclusion from such experiments, that we may make choice of the sort of grain which happens to be cheapest to feed poultry, without much if any disadvantage, always excepting rye, when other sorts are to be had on reasonable terms.

It required experiments of a different kind to prove whether there is any economy, or the contrary, in feeding poultry with boiled grain, and this was readily ascertained by finding first how much dry grain sufficed one or more fowls, and then boiling the same quantity and trying how much of that would in like manner be sufficient. The experiments which, for this purpose, M. Reaumur made with the different sorts of grain, were as follows:—

Rye.—Although, as we have seen, rye is very considerably increased in bulk by boiling, so far from being more sufficing, it becomes less so; for fowls will eat rather more of it when it is boiled than when it is raw and dry. Seven hens and a cock, which consumed only three-fourths of a measure of dry rye in one day, ate in the same time three measures of the boiled grain. Consequently, as three measures of boiled rye are equivalent to four-fifths of dry, it would cost one-twentieth more to feed fowls with boiled than with dry rye, four-fifths being one-twentieth more than three-fourths.—The globules of rye are almost the same size, according to M. Raspail, with the globules of wheat.

Oats.—It appears, that although oats are increased by boiling nearly one-half, they are not, any more than rye, rendered more sufficing as food; for the fowls, which, in two days, would have eaten four measures of dry oats, consumed in the same time several measures of the boiled grain. Consequently, so far as fowls are concerned it is no saving to boil oats; though this does not prove that the same holds with regard to horses whose power of digestion are so inferior to those of fowls.

Buckwheat or Brank.—This grain is increased by boiling still more than oats, since four measures, when well boiled, swell to fourteen. Notwithstanding, there is little advantage obtained by boiling it for fowls, as they will consume the fourteen measures of the boiled grain nearly in the same time which the four measures of the dry grain would have sufficed them.

Maize or Indian Corn.—This grain is more profitable as food for poultry when boiled than when raw; for the fowls which would have eaten a measure and a quarter of dry maize, consumed only three measures of the boiled grain, and these three are not equivalent to one measure of dry maize. But it is worth remarking, that the fowls experimented upon continued only for two days able to get through three measures a day of the boiled maize. After this time, they either lost their appetite or came to dislike the food, since they could not then eat quite two measures of the boiled grain.—Now calculating that they had continued to eat even as much as three measures of boiled maize a day, there would be a saving of more than one-fifth; and if they were satisfied with two measures, the advantage would be much more considerable, inasmuch as this would not be equivalent to two-thirds of a measure of the dry grain. The saving in this case would be one-third and one-fifth, that is eight-fifteenths or more than one-half.

Barley.—This grain also was found upon trial to be much more economical when given to poultry boiled than raw. Fowls, which would have consumed two measures of the dry barley a day, got through only three measures daily of the boiled grain.—Now, as ten measures of boiled barley are produced from four measures of dry, three measures are, therefore, equivalent to no more than six-fifths of a measure of dry.—The expense consequently in dry barley, is to that of boiled as ten-fifths to six-fifths, that is, as ten to six or as five to three, showing a saving of two-fifths by feeding poultry with boiled instead of dry barley. This result is, no doubt, owing to the more effectual bursting of the grains of fecula, and setting free the dextrine contained in them.

Wheat.—The results of the experiments on boiling grain, given above, show that wheat increases in bulk about the same as barley; but the experiments made on feeding poultry were considerably different in their results, the saving not being nearly so much with boiled wheat as with boiled barley; for the same fowls, which consumed three measures of boiled barley in one day ate three measures of boiled wheat. Now, 3 measures of boiled wheat are not equivalent to 2 measures of dry wheat, but only to a measure and a half of dry wheat, the quantity consumed in one day by the same fowls. But as a measure of boiled wheat is equivalent to no more than two-fifths of a measure of the dry grain, the three measures eaten in one day are equivalent only to six-fifths of dry wheat, and therefore the proportion of what they consumed of dry wheat was to what they consumed of the boiled, as fifteen-tenths to twelve-tenths, or as five to four; hence there is a saving of one-fifth by feeding with boiled wheat, as there is of two-fifths with boiled barley.

It is clearly proved, then, by these interesting experiments, that there is in most cases a considerable saving by feeding with boiled grain. It would be well if some intelligent gentleman would undertake similar experiments on feeding horses and cattle with boiled or steamed grain or meal. The advantage of feeding with crushed grain instead of giving it unbroken has been very satisfactorily proved and acted upon by Captain Cheyne (*Quarterly Journal of Agriculture*, iii. 1024, and iv. 378,) and recommended by Mr. Dick and others. The steaming of potatoes is well known to be advantageous in feeding both horses and cows, and more particularly in causing hens to lay, and in fattening pigs. Why should not the various sorts of grain, such as peas and beans, and meal, such as barley meal, given for similar purposes, not be advantageously increased in their nutritive properties by the same means? The expense of fuel, though it ought to be taken into the account, must be small in comparison with the advantage, at least in districts where coal or other fuel is reasonable in price. In large concerns, also, the expense of fuel would of course be proportionally less when compared with the saving in food.

Bread-making.—The most complete method hitherto discovered, for bursting all the globules of fecula, is the usual process of making bread, or, as chemists term it, *panification*. This arises from the presence in wheat flour of a substance termed gluten, associated with the globules of fecula, and constituting in the unbroken grain its cellular texture of frame-work. It would lead us too far from our present object to go into the history of this important substance minutely, but it may be necessary to state that the gluten may be procured by kneading and washing a piece of dough, made with wheat flour, in a stream of water, till all the globules of fecula are washed out. The gluten thus obtained is a greyish mass, elastic, like Indian rubber, when moist, and incapable of being dissolved in water. It is these two properties which render it so important in bread-making.

When a loaf is put into the hot oven, the steam and gases expand within it, and raise up the elastic gluten into bladder like vesicles; and by this means expose the globules of fecula in the dough more uniformly to the heat than could be effected without such agency. In consequence of this they burst; and in a well baked loaf of bread not a single unburst globule of fecula can be found. On the Continent this is practically understood in the districts where they feed their horses chiefly on bread, as in most parts of Belgium, Prussia, and Switzerland. The bread thus given to horses is coarse, dark colored, and rather sour, from leaven being employed instead of yeast; but the partial fermentation caused by the leven must assist in bursting the globules, and setting free the

dextrine from the action of the acid thus developed.

According to M. Raspail, and the fact has been stated by others, the more of other fecula we mix with good wheat flour, containing its due proportion of gluten, the less increase of weight does the bread acquire For example, six pounds of flour will produce eight pounds of bread; but if three pounds of potato-starch be mixed with three pounds of wheat flour, instead of eight pounds of bread, there will only be six pounds. He explains the circumstance from the globules of fecula while unbroken not imbibing water, but being only moistened by its adhering to them; while the gluten sucks in water like a sponge, and the more it is kneaded the more water it will take up. The mixture, therefore, of other flour with that of wheat diminishes not only the weight but the nutritive materials in the bread.

Concluded in our next.

From the New-York Farmer.

AGRICULTURAL TOUR.

No. 4.

Tonawanda is a small stream flowing into the River Niagara about twelve miles above the Falls. It is dammed at its mouth and is used for several miles as part of the Erie Canal. A considerable village is growing up at the mouth of the river, nearly opposite to Whitehaven on Grand Island; and the timber from Grand Island, destined for the New-York and Boston shipyards is here admitted into the Grand Canal. The railroad between Buffalo and Niagara Falls passes through the village; and in future passengers in the Canal packets will probably disembark here and take the cars to Buffalo by which means a distance, which by water occupies about three hours will be passed over in less than an hour, 3 quarters of an hour will ordinarily be deemed sufficient; a great and most valuable gain to travellers. The river Niagara, at the entrance of the Tonawanda into it, presents deep water and a secure anchorage for large vessels, which may be employed in navigating the Lakes; but the difficulty of reaching the Lake against a strong current and some difficult rapids, excepting under peculiarly favorable winds or very strong power of steam may be thought to present strong obstacles to its use and improvement as a port of ship nent. These however, will be easily overcome by steam power; and availing of the ship canal at Black Rock. This and Whitehaven, must from the facility of procuring the best of timber in the immediate vicinity, offer a most favorable situation for the building of vessels. The village is destined to extraordinary prosperity from its advantageous situation and the great improvements now in progress. The land in the vicinity of Tonawanda is of an excellent description. As far as the backwater of the creek extends, a distance of three or four miles, this circumstance is prejudicial. the cultivation in some places being necessarily hindered, and the general healthiness of the country has been supposed to be affected. The latter circumstance however is becoming obviated by clearance and cultivation. But when the land is not so affected the soil is eminently favorable to wheat, oats, potatoes, and grass. Indian corn is sometimes cultivated with success but it cannot be considered a safe crop. The soil is improved by cultivation. The whole country is of calcareous formation: loam resting upon limestone and intermixed with limestone, gravel, which in the form of a carbonate is seen intermixed abundantly with the soil in small grains. These being brought to the air by the plough become decomposed; and the soil in this way acquires constantly increased blackness and fertility. Pease are a favorite and very productive crop. On visiting one of the best farms in the neighborhood of the creek, the farmer informed me that his crop of wheat usually averaged from twenty-five to thirty bushels per acre; of pease thirty bushels; of grass one and a half to two tons per acre. He uses no manure for his land excepting that he has spread some on his grass land; and he showed me a field which with the exception of three intermediate years, had been in wheat thirteen years without a diminution of the crop. I have perfect confidence in the honor of the gentleman who made these statements, but possibly there may be some little unintentional overstatement; as it almost always happens, where crops are not matter of exact measurement, but of estimate or conjecture merely, there is a tendency to overstate. A crop of wheat certainly without very careful cultivation, averaging from twenty-five to thirty bushels is quite large. The aftermath in the fields was short; and by no means a fair test of what the land is capable of being made to do. The farming in most parts of this country was inferior and slovenly; and the regular introduction of clover, with all the grain crops and the ploughing it in, would produce a most favorable and extraordinary change in their condition. Speculation however, is so rife, other means of procuring money seem to promise so much quicker returns; and labor is indeed so difficult to be procured, and withal so expensive and troublesome, that mere cultivation, it is to be feared, will continue to be regarded as a secondary interest. The passage of the Canal through this country, and the multitude of canal boats, which seem to pass and repass in an almost uninterrupted succession, afford a ready and cash market for all the produce of their farms.—Their wants even then are but imperfectly supplied. The growth of the country here is in many places magnificent—oak, black-walnut, maple, whitewood and elm, of the largest description. Most of the wood, which is cut here, is sent to Buffalo, or sold at the Steam Saw Mill on Grand Island.—Much of that which is suitable for timber is sawed at the same establishment for this purpose.

The ride from Black Rock to the Niagara Falls, by the side of the Niagara River, is extremely beautiful; the expanse of water, the several fine islands skirted with rich foliage to the waters edge, and the excitement of an approach to the Falls, which it is not easy to suppress, though you may have visited them repeatedly, render this jaunt exceedingly interesting and delightful. The ride for some miles below the Falls towards Lake Ontario increases in picturesque effect; and presents many points of view, embracing the Falls themselves, the wonderful passage of this torrent through its walls of natural masonry, which it would seem, must have occupied centuries, not to erect, but to excavate and widen, the compression of the torrent before it branches into the whirlpool, where owing to the narrowness of the passage, and the velocity with which it is forced onward, the central ridge of waters like the roof of a barn is elevated at least ten feet above the edge of the waters at the shore; the whirlpool itself, and afterwards the whole course of the river until it enters into Lake Ontario, which is seen distinctly from the high grounds, and lastly the magnificent and glittering expanse of the Lake itself, present a succession of views unrivalled and enchanting.

The land on the shores of the Niagara River from Tonawanda to a distance of three miles below the Falls as far as my ride extended, is similar to what I have already described excepting that in some places the clayey portions predominate much more here than in others. A good deal of this land has been a long time cleared and the stumps removed. It is much of it of a very fine character for wheat. A highly intelligent gentleman of the village at the Falls, who accompanied me, showed me a field which with the exception of one year had been for thirty years in succession in wheat, without manure and without any apparent diminution of its fertility. Twenty to twenty-five bushels of wheat are considered an average yield; thirty are often obtained. The first ploughing is generally shallow; afterwards deeper ploughing improves the soil. Plaister and clover have not yet been tried. Improvements are in progress and a spirit of enterprize awakened, united with intelligence, from which the best effects will result; and which must soon put a different aspect on the whole face of this splendid country; for which in respect to picturesque scenery, nature has lavished her gifts in prodigal and almost unrivalled profusion.

Opposite Tonawanda, and lying along in the river for a distance of about nine miles, is Grand Island, a magnificent tract of land of an average width of four miles, and containing about eighteen thousand acres.—The Northern extremity is in sight of the the rapids of the Great Falls, though steam vessels and others cross far below it from the American side to Chippeway on the Canada shore. A small portion of the Island is at present cleared; and the remainder is covered with a noble growth of the most valuable white oak timber, black walnut, and other wood. The surface of the Island presents few inequalities and the highest point is but few feet above the river, in the middle of which it is situated; and which furnishes deep and excellent ship channels on either side. The soil is excellent, where it has been brought into cultivation; some of it being alluvial and the rest a rich loam with an intermixture in greater or less measure of clay; suitable for wheat, oats, grass, and succulent vegetables; and if the beet cultivation for sugar should be pursued to any extent, emi-

nently adapted to that product. It is likewise extremely well suited for dairying and grazing. The land hitherto being held in common, and the objects of the company being mainly the getting of ship timber to market, small attention has been given to agricultural operations and improvements. I was much gratified here in looking at the barn above 100 feet in length erected by Lewis F. Allen, Esq., near the village of White-haven for the keeping of the numerous ox-teams employed in the saw mill at that establishment. The barn is entered lengthwise, and the great floor extends through the whole. The mows for hay are on each side of the floor; and leantos, or close sheds are projected from each side of the barn for the whole length, which furnish stables for the cattle. The whole is well contrived considering the flat situation in which it stands; and the teams and every thing connected with the establishment, in excellent and farmer-like condition. I shall forbear a more particular account of it, as I hope at a future time to receive it from Mr. Allen's own pen.

H. C.

From the New-York Farmer.

AGRICULTURAL TOUR, No. 5.

To Lewis F. Allen, Esq. of Buffalo, well known as eminent, among the intelligent and spirited agriculturists in New-York, I am much indebted for various polite attentions, and much agricultural information. Mr. Allen is spiritedly engaged in endeavors to improve the live stock of the country; and I had the pleasure of seeing in his possession several very fine animals of the improved Durham Shorthorns, which certainly did great credit to his management, and his skill in their selection. I will not undertake to describe them particularly, as I hope that he will himself in due season favor the public with his success and opinions in this matter. The samples of this stock in his possession are of high pedigree and fine promise; and I am particularly anxious that by some continued and exact observations he should determine the dairy properties of his cows. He thinks highly of them in this respect; but in a matter which can be easily tested, we want accurate experiments and observations. Of his improved breed of swine, I can speak in the highest terms. They are not of the largest class, but their extraordinary thrift and admirable forms place them among the best that have fallen under my notice.

Mr. Allen is the general superintendent of the establishment at White-Haven. The saw mill at this place is an interesting object of curiosity. It is one hundred and fifty feet square; it drives six gangs of saws, and two single saws by a steam engine of one hundred horse-power. Eighteen cords of wood are required per day for supplying the engine. Besides the timber on the island large quantities of pine are brought from Canada and sawed at the mill. Their fine timber is in quick demand at Buffalo, and in the vicinity, and their oak timber is exported to the Atlantic States. The frames of several large vessels of from 400 to 700 tons have been sent to the sea-board.

Accounts of the city of Buffalo, have within a few years been so much before the public, that I shall do nothing more than to express my admiration of the rapid growth: the increase of population and the rise in the value of property, of this Queen of the West. She is destined to still farther increase; and looking back upon her almost magical advances for the last few years, it is not easy to conjecture the limits to which her business may hereafter be carried. The land in the immediate neighborhood of Buffalo is not under cultivation: and compared with the demand and the intrinsic resources of the country, the meagre and inferior condition of her meat, vegetable, and fruit market is matter of just surprise. It seems impossible that it should long remain so; and the universal complaints on this subject, and the erection of large and handsome market houses will undoubtedly contribute to its improvement. The floating character of the population has undoubtedly retarded these improvements; the fever of speculation, which has been more violent in no place, has directed the attention to more exciting and engrossing objects, and the extraordinary, and to those, who have not witnessed it, the almost incredible influx of strangers, emigrants, and adventurers has extended the demand beyond the present ability to supply.

A large tract of land in the immediate neighborhood, eighteen miles in length and seven in breadth, is held by the Seneca Indians. This great tract containing, 49,000 acres, as seen from the road which passes through it, embraces much land of the very best character. At present not much of the land is cultivated; and though there are some striking exceptions, the cultivation is in most cases very imperfect and slovenly. In some instances we saw tidy frame houses, neat enclosures, and the front yards ornamented with flowers. The Indians seem every where to be an indolent and improvident race, and unwilling to do more than procure a bare subsistance. Their wants in general are few, and their endurance under hardship and privation well known. Their appearance is in general squalid and disgusting. They are constantly to be seen in the streets of Buffalo, where they bring their baskets, their ornamental work, their reticules, moccasins, and slippers made of leather and inwrought with beads, to sell; and likewise berries and herbs. They stand about the streets, and stroll from one place to another gazing in stupid inanity. They are harmless and not giving to quarelling, but do not always understand, at least are not always wise observers of that great distinction in civil society, of *meum* and *tuum*. The men are a fine tall race, muscular and well proportioned; the women short, and in general extremely ugly; though in this matter they do not fall very far below the lowest class of Swiss and German women, who are to be seen constantly about the streets.

These Indians are entirely in the power of the State; and in my opinion ought to have been treated precisely like ignorant and helpless children. The State should maintain among them competent guardians and agents; and should compel them by fine, if it were practicable, and if other inducements failed, to clear, sow, build, enclose, and render their lands productive, and their condition comfortable, under a perfect assurance that the tenure of their improvements should be secure, and they should enjoy the fruits of their labor; instead of encouraging them, as is obviously too often the policy, in idleness, wretchedness, and vice, in order that they may become easily in the end, dispossessed of their territory or their race itself be extinguished. One great bar to the improvement of their condition arises undoubtedly from the custom prevailing among hem, by which all the improvements made by any one, with all his personal property of every description, instead of giving at his death, by his will, to his squaw or children, in that event reverts to the tribe; and is scattered among the community. The great principle of accumulation, the right of property, and the power of controling and transmitting that property according to our pleasure at death, though principles violently assailed in these days of Agrarianism, and often in their operation productive of apparently unequal and unfortunate results, are notwithstanding, of the highest moment to the virtue of individuals, and the general welfare of the community.

There are some agricultural improvements in the vicinity of Buffalo, on the farm of Hiram Pratt, Esq., which are capital, and deserve particular notice. His farm lies on the shores of the Lake, and an extensive tract of bog, which was constantly filled with water from the Lake, has been drained; the waters in a great degree excluded, drains cut in various directions with perfect neatness and by skilful hands, the bushes and stumps extracted, and a meadow of a hundred acres extent, brought into grass; and presenting, I must admit, the most successful and beautiful improvement that my eye has ever rested upon. The process has occupied but a short time and, compared with the value and productiveness of the redeemed land, has been executed at small expense; and at an outlay, which will be immediately returned four fold. The growth of the second crop of grass upon it, which was all that the season permitted me to see, was most luxuriant; and the land is brought into condition for other crops to be cultivated with advantage. I have had only to regret, that Mr. Pratt's unusual engagements at the time, prevented his giving me that detailed account of the process and expenditures, which I should have been glad to lay before the readers of the New-York Farmer. The almost unsurpassed fertility of this deep alluvion, when the waters are taken from it, and the immediate vicinity of a quick market for all the produce, which can be gathered from it, would justify almost any expenditure for the redemption of this land. The process is still going on, and large adjoining tracts are to be cleared, drained, and subdued.

The trees on the uncleared lands bordering the turnpike, and from four to eight miles from Buffalo, in height and diameter surpass any thing that I ever witnessed. They are chiefly elm, white oak and white wood intermixed; and are of most singu-

lar beauty and magnificence. Similar remarks apply to many of the forests of this western world; and those of us, who have been accustomed only to the stented growth of more northern and less fertile soils, may be allowed to express our surprise, may I not add the enthusiasm of our admiration, coupled with deep humility, when standing among these mighty and untouched forests; and looking up to the spreading tops of these magnificent plants, these noble tenants of the soil, who have survived the storms and decays of centuries.

I am unwilling to quit Buffalo, without alluding to, I will not say the tide, but the torrent, the rushing flood of emigration, pouring itself westward. During a protracted stay of several weeks at Buffalo, it seemed "to cease not," day or night. Two, three, and sometimes five steamboats left Buffalo daily, for the upper shores of the Lake, beside other vessels; and all of them carrying their hundreds and hundreds. I have been often asked since my return, if these were not principally foreigners. I can only answers that of those whom I saw there was but a small sprinkling of Irish, and comparatively few Swiss and Germans. The great majority were New-Yorkers and New-England men, of the best class of yeomanry; respectable in manners and appearance, and of substantial condition and equipments. Such a population, especially migrating as is often the case in companies, and I may say villages, are not compelled to pass through the *chrysalis* state; but commence immediately with all the advantages and improvements of an advanced condition of society.

H. C.

List of subscribers to the **Railroad Journal,** that have paid, (continued.)

E. Smith, city New-York, January 1, 1838.
George Johnson, city New-York, 1st January, 1838.
S. G. Cornell, city New-York, 1st January, 1838.
J. W. Cochran, city New-York, 1st May, 1838.
G. N. Dennistown, Albany, 1st Jan. 1837.
O. R. Van Benthuysen, Albany, 1st January, 1838.
W. C. Bouck, Albany, July 1, 1837.
N. P. Tallmadge, Poughkeepsie, N. York, 1st January, 1838.
C. B. Stewart, Utica, N. York, 1st January, 1838.
J. M. Gardner, Newburgh, N. York, April 1, 1837.
P. Sours, Oswego, New-York, 1st January, 1838.
Ulster Iron Co., Saugerties, New-York, 1st January, 1838.
Thomas Turner, advertising, Troy, N. Y., 1st January, 1835.
Thomas Moore, Philadelphia, Pa., 1st Jan. 1838.
J. M. Sanderson, Phil., Pa., June 1, 1837.
S. Bradford, Phil., Pa., 1st January, 1838.
J. Snowdon, Jr., Brownstown, Pa., April 1, 1838.
McClury, Wade & Co., Pittsburgh, Pa., 1st January, 1838.
J. A. Roebelling, Saxenburgh, Pa, April 1, 1838.
W. Woodville, Baltimore, Md., 1st January, 1837.
Baltimore and Susquehannah Railroad Co., Baltimore, Md., 1st January, 1838.
W. Patterson, Baltimore, Md., 1st January, 1837.
P. R. Hoffman, Baltimore, Md., 1st January, 1838.
Wilmington and Susquehannah R. R. Co., Wilmington, Del., 1st January, 1838.
J. Randall, Jr., Wilmington, Del., August 1, 1837.
J. P. Stabler, Wilmington, Del., 1st January, 1838.
Betts, Puzley & Harlan, Wilmington, Del., 1st January, 1838.
Charles Bush, Wilmington, Del., 1st January, 1838.
Isaac Orr, Georgetown, D. C., April 1, 1838.
S. Yount, Bowman's Mills, Va., June 1, 1837.
P. Martineau, Fredericksburgh, Va., 1st January, 1838.
O. O Wilder, Eckford, Michigan, 1st January, 1838.
Mr. Coffee, Athens, Tenn., March 1, 1838.
L. B. Wilson, Logan's Port, Ia., 1st January, 1838.
D. Hardenburgh, Laporte, Ia., May 1, 1838.
Rev. Wm. Twining, Madison, Ia., 1st January 1838.
J. E. Thompson, Augusta, Geo., 1st January, 1838.
J. F. Mansfield, Savannah, Geo., 1st January, 1838.
S. R. Curtis, McConnelsville, Ohio, 1st January, 1838.
Literary and Scientific Institute, Columbus, Ohio, 1st January, 1838.
A. Twining, New Haven, Con., 1st January, 1838.
Francis Jackson, Boston, Mass., 1st January, 1838.
John Wilkinson, St. Andrews, N. B., 1st January, 1838.
R. J. Kennett, (2 copies,) London, England, July 1, 1837.

Advertisements.

AVERY'S ROTARY STEAM ENGINES.—AGENCY.—The subscriber offers his services to gentlemen desirous of procuring Steam Engines for driving Saw-Mills, Grain-Mills, and other Manufactories of any kind.

Engines only will be furnished, or accompanied with *Boilers* and the necessary *Machinery* for putting them in operation, and an Engineer always sent to put them up.

Information will be given at all times to those who desire it, either by letter or by exhibiting the engines in operation in this city.

Inquiries by letter should be very explicit and the answers shall be equally so.

D. K. MINOR,
30 Wall-st., New York.

DRAWING INSTRUMENTS.—E. & G. W. Blunt, 154 Water-street, New-York, have received, and offer for sale, Drawing Instruments of superior quality, English, French, and German Manufacture.

They have also on hand Levels of superior quality at low prices.

☞ Orders received at this office for the above Instruments.

FOR SALE AT THIS OFFICE,

A Practical Treatise on Locomotive Engines, with Engravings, by the Chevalier De Pambour—150 pages large octavo—done up in paper covers so as to be sent by mail—Price $1 50. Postage for any distance *under* 100 miles, 40 cents, and 60 cts. for any distance exceeding 100 ms.

Also—*Van de Graaff on Railroad Curves*, done up as above, to be sent by mail—Price $1. Postage, 20 cents, or 30 cents, as above.

Also—Introduction to a view of the works of the *Thames Tunnel*—Price *fifty cents*. Postage as above, 8 cents, or 12 cts.

*** On the receipt of $3, a copy of each of the above works will be forwarded by mail to any part of the United States.

A COURSE OF INSTRUCTION IN CIVIL ENGINEERING, by informal lectures, to occupy two months, commencing the 1st week of May.—Comprising

The use of the theodolite, level, Compass plain table, cross, and sextant explained upon the instruments themselves: topographical drawing executed under supervision; survey of routes; problems of excavation and embankment; railroad curves; all the usual details of construction upon common roads, railroads, and canals; including bridges, culverts, tunnels, and the various kinds of motive power; nature, strength and stress of materials; masonry, carpentry and constructions in iron; alluvial deposites, guaging of streams, &c.—The whole purely elementary. Terms of admission to the course, $20.

Apply to C. W. Hackley, Professor of Mathematics in the University, 32 Waverly Place.

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS OF GREAT BRITAIN.

The first volume of this valuable work, has just made its appearance in this country. A few copies, say *twenty-five* or *thirty* only, have been sent out, and those have nearly or quite all been disposed of at *ten dollars* each—a price, although *not* the *value* of the work, yet one, which will prevent many of our young Engineers from possessing it. In order therefore, to place it within their reach, and at a convenient price, we shall *reprint* the entire work, with all its engravings, *neatly done* on wood, and issue in six *parts* or *numbers*, of about 48 pages each, which can be sent to any part of the United States by mail, as issued, or put up in a volume at the close.

The price will be to subscribors *three dollars*, or *five dollars* for two copies—*always in advance*. The first number will be ready for delivery early in April—Subscriptions are solicited.

TO CONTRACTORS.

JAMES RIVER AND KANAWHA CANAL.

THERE is still a large amount of mechanical work to let on the line of the James River and Kanawha Improvement, consisting of twenty locks, about one hundred culverts and several large aqueducts, which will be offered to responsible contractors at fair prices.

The locks and aqueducts are to be built of cut stone

The work contracted for must be finished by the 1st day of July, 1838

Persons desirous of obtaining work are requested to apply at the office of the undersigned, in the city of Richmond, before the fifteenth of May, or between the fifth and the fifteenth of July.

CHARLES ELLET, Jr.
Chief Engineer Jas. Riv. & Ka. Co.

P. S.—The valley of James River above Richmond is healthy.

16—10t

PATENT RAILROAD, SHIP AND BOAT SPIKES.

*** The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviera, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

TO RAILROAD CONTRACTORS.

SEALED proposals will be received at the office of the Selma and Tennessee River Railroad Company, in the town of Selma, Alabama, for the graduation of the first forty miles of the Selma and Tennessee Railroad Proposals for the first six miles from Selma, will be received after the first of May, and acted on by the Board on the 15th May. Proposals for the ensuing 34 miles, will be received after the 10th May, but will not be examined until the 1st of August nex, when the work will be ready for contract.

The line, after the first few miles, pursuing the flat of the Mulberry Creek, occupies a region of country, having the repute of being highly healthful. It is free from ponds and swamps, and is well watered—The soil is generally in cultivation, and is dry, light and sandy, and uncommonly easy of excavation.—The entire length of the line of the Selma and Tennessee Railroads, will be about 170 miles, passing generally through a region as favorable for health as any in the Southern Country

Owing to the great interest at stake in the success of this enterprise, and the amount of capital already embarked in it, this work must necessarily proceed with vigor, and I invite the attention of men of industry and enterprise, both at the North and elsewhere to this undertaking, as offering in the prospect of continued employment, and the character of the soil and climate, a wide and desirable field to the contractor.

Proposals may be addressed either to the subscriber, or to General Gilbert Shearer, President of the Company.

ANDREW ALFRED DEXTER, Chief Engineer
Selma, Ala., March 20th, 1837. A 15 tf

ROACH & WARNER,

Manufacturers of OPTICAL, MATHEMATICAL AND PHILOSOPHICAL INSTRUMENTS, 293 Broadway, New York, will keep constantly on hand a large and general assortment of Instruments in their line.

Wholesale Dealers and Country Merchants supplied with SURVEYING COMPASSES, BAROMETERS, THERMOMETERS, &c. &c. of their own manufacture, warranted accurate, and at lower prices than can be had at any other establishment.

Instruments made to order and repaired. 14 1y

FRAME BRIDGES.

THE undersigned, General Agent of Col. S. H. LONG, to build Bridges, or vend the right to others to build, on his Patent Plan, would respectfully inform Railroad and Bridge Corporations, that he is prepared to make contracts to build, and furnish all materials for superstructures of the kind, in any part of the United States, (Maryland excepted.)

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawaunkeag river on the Military road, in Maine. On the national road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contoocook river at Henniker, N. H. Across the Souhegan river, at Milford, N. H. Across the Connecticut river, at Haverhill, N. H. Across the Contoocook river, at Hancock, N. H. Across the Androscoggin river, at Turner Centre, Maine. Across the Kennebec river, at Waterville, Maine. Across the Genesse river, at Squakiehill, Mount Morris, New-York. Across the White River, at Hartford Vt. Across the Connecticut River, at Lebanon, N. H. Across the mouth of the Broken Straw Creek, Penn. Across the mouth of the Cataraugus Creek, N. Y. A Railroad Bridge diagonally across the Erie Canal, in the City of Rochester, N. Y. A Railroad Bridge at Upper Still Water, Orono, Maine. This Bridge is 500 feet in length; one of the spans is over 200 feet. It is probably the FIRMEST WOODEN BRIDGE ever built in America.

Notwithstanding his present engagements to build between twenty and thirty Railroad Bridges, and several common bridges, several of which are now in progress of construction, the subscriber will promptly attend to business of the kind to much greater extent and on liberal terms. MOSES LONG.

Rohester, Jan. 13th, 1837. 4—y

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States 9—1y

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Folger & Coleman, for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S Durfee & Co., will be done by the new firm, the same superintendant and machinery are employed by the new firm that were employed by S. S. Durfee & Co. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

12th month, 12.h, 1836. Hudson, Columbia County State of New-York.

ROBT. C. FOLGER,
33—tf. GEORGE COLEMAN,

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do caststeel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron v4—tf

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleeckerstreet, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation 30dot

TO RAILROAD CONTRACTORS.

PROPOSALS will be received, at the office of the Hiwassee Railroad Com., in the town of ATHENS, TENNESSEE, until sunset, of Monday, June 12th, 1837; for the grading, masonry and bridges, on that portion of the HIWASSEE RAILROAD, which lies between the River Tennessee and Hiwassee. A distance of 40 miles.

The quantity of excavation will be about one million of cubic yards.

The line will be staked out; and, together with drainings and specifications of the work, will be ready for the inspection of contractors, on and after the 1st day of June.

JOHN C. TRAUTWINE,
Engineer in Chief Hiwassee Railroad.
16—6t.

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